Memorial Lecture
ON
LISTER'S GREAT ACHIEVEMENT.

Delivered before the Royal College of Surgeons of England on May 14th, 1925,

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MR. PRESIDENT, LADIES AND GENTLEMEN,—Before I begin this lecture I should like to say how much we all regret the sudden death of Sir Rickman Godlee, which has cast a gloom over to-day's proceedings. Sir Rickman Godlee took a very active part in the Lister Memorial funds and was, I know, looking forward very much to the proceedings to-day. I also had been looking forward to meeting him. Sir Rickman Godlee and I were very closely associated for many years as Lister's private assistants, and a more delightful, able, and loyal colleague I cannot imagine. I am sure that everyone here sympathises most sincerely with Lady Godlee in her great bereavement.

I must thank the Council of this College for the great honour they have done me in awarding to me the first Lister Memorial Medal and Prize. I need hardly say that the medal commemorating my great master and friend will be one of the most treasured of my possessions.

The subject of the lecture which must be given by the recipient of this honour is left entirely to his judgment and will naturally in the future refer in the main to work in which he has himself been principally engaged. But on this occasion I feel convinced that as the first recipient of this honour, and as one of the little band of men [1] who knew Lister and his work most intimately, and who had the extraordinary good fortune of being closely associated with him throughout his great achievement, I ought to put on record matters connected with his work and not especially concerning myself. I hope that my decision will be acceptable to you.

As a matter of fact, I have for some time had a great desire before I depart this life to place before the profession as fair a statement as I can of Lister's great achievement, his aims, the principles on which he started, how they became modified as time went on, and the final result. Having, however, practically given up active surgical work I have felt more and more diffidence in laying before the profession a story which to some may appear to be past history and not of any actual living value at the present time. This award, however, provides the stimulus, and indeed the immediate necessity, for carrying out my desire. The story I have to tell, though going back for just 60 years, is one still full of vitality, of instruction, and of the gravest importance to surgery. It is far from being a closed book, the whole matter is still fluid, perfection has not yet been obtained in all directions; indeed, at the present time the tendency seems to be rather to remain satisfied with what has been achieved than to continue the effort to obtain perfection.

When I came to write a lecture on these matters in full I found that, even after cutting it down as far as possible by omitting extensive passages and by condensing others very much, its delivery would far exceed the time at my disposal and try your patience to breaking point. At the same time I wished to make it complete, and I have, therefore, attempted to solve the problem by taking out of the original lecture the more personal matters which seem most suitable for a general discourse (and my own experience is that the less the dry detail in a lecture the more successful it is) and publishing in the same volume with this discourse as an appendix the remainder of what I wrote originally, which can be perused and pondered over at leisure.

[1] In Glasgow, Lister's private assistant was Sir Hector Cameron who, I am glad to say, is still well and active; in Edinburgh his assistant was Dr. John Bishop, who died shortly after Lister went to London—a most lovable man and deeply regretted by all who knew him. In London his assistants were the late Sir Rickman Godlee and myself.

THE FIGHT AGAINST SEPTIC DISEASES OF WOUNDS.

The story that I have to tell to-day is one of the most fascinating tales that I know of and far exceeds in interest the most exciting detective story ever written. And its influence on the life and health and usefulness of mankind surpasses all imagination; and it is a true story. It is the story of a fight against a series of diseases—the infective or septic diseases of wounds—which have attacked wounds probably since the world began. As a matter of fact, any wound of the skin, whether as the result of an accident or of an operation deliberately performed by the surgeon, involved up till Lister's time a very great risk to the patient of serious illnesses called "septic diseases," which, indeed, very often proved fatal. And although numerous attempts had been made by surgeons of all countries and through many ages to discover the cause and to find a remedy for these diseases, no real progress was made till Lister took up the work. Up to that time a surgical ward in a hospital was a place in which the most of the patients were visibly ill, with flushed faces, parched lips, delirium, severe pain, &c., and many of them were evidently on the verge of death; the wards were pervaded with a peculiar mawkish odour which was very trying to newcomers. I suppose very few here to-day remember those days. What a contrast to the surgical ward of to-day with its fresh air, happy and contented patients, looking as if nothing had happened to them, and very slight mortality. This we owe to Lister, and much more, for not only has his work led to the practical disappearance of septic diseases after operations, but it has enabled the surgeon to perform many operations which prolong life, restore movements, rectify deformities, and add to the usefulness and comfort of mankind.

Lister's first introduction to septic diseases was when he became a dresser in the surgical wards at the University College, London. I think that his very first case had been attacked by phagedænic gangrene, one of the most terrible of these septic diseases. That and other similar cases impressed him so greatly that he never forgot them, and always felt that no study was more urgent or might be more fruitful than the attempt to find out the cause, the prevention, and the best methods of treatment of these septic diseases.

SEPSIS AND PUTREFACTION.

We may here pass over his earlier years and come to the time when he was professor of surgery in Glasgow University and was appointed one of the surgeons at the Glasgow Royal Infirmary. This was late in 1861, and by that time Lister had done excellent experimental work on the early stages of inflammation, coagulation of blood, &c.—work which was to be of the greatest value to him in future and for which, I may add, he had been elected at the early age of 33 a Fellow of the Royal Society. At this time he had come definitely to the conclusion that sepsis was closely bound up with putrefaction of the blood and discharges in the wound, and that if he could only prevent this putrefaction septic diseases would in all probability disappear; the cause of putrefaction was, however, still unknown. Most surgeons attributed it to the action of the gases of the air, especially of the oxygen, on the organic fluids in the wound, while others pre-supposed the existence and action of indefinite bodies which they called "miasms" and which were supposed to develop in unhealthy regions

and pass into the air. On the oxygen theory many attempts had been made in former years to prevent the access of air to the wounds, but without any improvement as regards sepsis, and on the assumption that the gases in the air, or the "miasms" in the air which were also supposed to be gaseous, were the cause of the trouble Lister could not devise any remedy. Lister, however, made an extensive experiment in his wards with ordinary cleanliness but without success, and one can quite imagine his depression when he found that the best methods that he could think of did not help him at all and that pyæmia and all the other septic troubles dogged his footsteps and rendered his best work nugatory.

THE ORIGIN OF LIFE.

But it so happened, though Lister did not then know it, that the cause of putrefaction was being revealed about the time that he was appointed professor of surgery in Glasgow. For over a century a very interesting and sometimes a very heated controversy had gone on as to the origin of life, and in the first instance the controversy was carried on chiefly by priests. Indeed, I presume that it began on some such theological problem as this: Was there only one creation of life as suggested in the Bible, or is it possible that the conglomeration of certain atoms in certain ways would, shall we say, attract the vital spark (just as an electric current may be set up by the contact of various metals) and that in this way a new living organism might be produced? The advocates of the latter view, which came to be spoken of as "spontaneous generation," sought to support their opinion by elaborate experiments which were quickly disposed of by their opponents but only to lead to a fresh crop of experiments. One would never have thought that such an abstruse matter would have any practical influence on commerce and still less on the lives and health of living beings. As regards the former, however, the subject of fermentations became involved and it then became a matter of importance to chemists. About 1860 Pasteur not only closed the proof against the spontaneous generation of yeast cells, but also, I believe, quite unwittingly opened up a new and, as it ultimately turned out, an extremely vital line of research by pointing out that other fermentations apart from the vinous, such as the butyric and the putrefactive, were also dependent on living organisms which gained access to the putrescible fluids with the dust in the air or on surrounding objects and especially from other putrefying media. Pasteur himself does not seem to have had at the time any idea of the importance of this part of his investigations, and as far as I can ascertain only three men thoroughly realised it or at any rate made any attempt to utilise the knowledge within the next few years. These men were Jules Lemaire, Spencer Wells, and Joseph Lister. It will be of interest for the moment to sketch out what each of these men did with the knowledge which they acquired from Pasteur's work; in doing so I do not want in any way to compare these three men, but, as a matter of fact, just as no two persons have exactly the same finger-prints so I believe that no two persons have exactly the same arrangement of brain, and as thought and action are the results of the working of the brain no two persons will take exactly the same steps in the solution of a problem. Thus it is very interesting to compare the result of the action of different types of brain.

CONCLUSIONS OF VARIOUS OBSERVERS.

Jules Lemaire was, I fancy, of the type of the delightful, old, learned family doctor. He was evidently good at surgery, but he had no surgical hospital appointment and so had not the opportunity of testing any views he may have formed; he was also much interested in scientific matters. He saw at once that Pasteur's statement as to the cause of putrefaction was of great importance. He wrote quite a good deal on the bad effects which might arise from bacteria, and he washed his wounds with various antiseptics, notably with carbolic acid, with the view of interfering with the growth of bacteria in the discharge. He never, however, suggested, as Lister did, that these antiseptics should be used to kill the germs before they got a footing in the body or in the wound, and he spoilt his case by advocating the use of carbolic acid for all sorts of diseases. Evidently Lemaire's advocacy of carbolic acid had attracted attention, for Declat thought it worth his while to claim priority in the use of the drug.

Something like three or four years elapsed, and then I find that Spencer Wells, one of the pioneers in ovariotomy and subsequently President of this College, in an address at the meeting of the British Medical Association in 1864[2] gave a most excellent description of Pasteur's work and its bearing on surgery. I do not think that a better résumé could have been made. Spencer Wells was a great practical surgeon and a bold operator, but, curiously enough, he did not follow up the logical conclusions that he drew from Pasteur's works. Indeed, his only remark as to the practical application of the work to which he called attention was that "surgeons should always secure the most scrupulous cleanliness and purity of everything surrounding them," and as regards any other treatment he advocates the internal administration of sulphites in the form of sulphite or hyposulphite of soda. There is no doubt that the recognition of the value of scrupulous cleanliness in the sense of preventing the putrefactive germs from getting a footing was a very important advance, but a good deal more was needed for perfection.

The third man, so far as I can find, who took up Pasteur's work was Joseph Lister. I cannot make out exactly when this knowledge first came to him, but I fancy it was in 1864. I understand that he was walking home with his colleague, Prof. Thomas Anderson, the professor of chemistry in Glasgow, one afternoon towards the end of 1864, discussing putrefaction and its causes, when the latter suggested that he should read certain papers on fermentation and spontaneous generation which had been recently published by a rising young French chemist, Louis Pasteur. Lister, who naturally was not conversant with chemical literature, had not heard of Pasteur's work, nor had he followed the controversy on spontaneous generation, but he at once got these papers,[3] and from the perusal of them he found that Pasteur's experiments showed that it was not the gases of the air that the surgeon had to fear but minute living particles floating in the air and settling on surrounding objects in the form of dust. And he learned further that so long as these particles were excluded from the putrescible material after it had been boiled there was no sign of living organisms or putrefaction in the material. As soon, however, as the protection was removed and the dust was allowed free admission, minute bodies belonging to the lowest class of vegetable life could be seen swarming in the fluid, and putrefaction very quickly set in. The conclusion was that some of the particles which were excluded by filtration or destroyed by heat were actually living germs which, as they developed in the putrescible material, set up the putrefactive fermentation just as the vinous fermentation was only set up on the admission of living yeast cells.

One can well imagine Lister's excitement and delight when he realised from Pasteur's work that the enemy with which he had to deal was not a gas present everywhere and practically impossible to get rid of or avoid, but living solid particles floating in the air or present in the dust, capable of being killed or avoided—still a difficult problem no doubt, but not an insoluble one. These "germs," as they were called

[2] Brit. Med. Jour., 1864, ii., 384.
[3] See Œuvres de Pasteur, by Vallery-Radot, 1922, vol. ii.

for a long time, were new to him and to the surgical profession generally. Long rods, known as vibrios, were comparatively easily seen swimming about in putrefying fluids, and also small rods and round bodies, but they had not been specially studied, and to many it seemed the height of absurdity to suppose that such minute bodies could be of any practical importance to the surgeon.

LISTER'S APPLICATION OF PASTEUR'S WORK.

I do not think that at this time Lister, nor indeed anyone else, had any very definite idea as to the *modus operandi* of these germs. It was enough for him for the time being that they were the cause of the putrefaction of the discharges from the wounds and that the putrid fluids were somehow or other, if not the cause, at least very closely associated with the causes of local and general septic diseases. Lister's application of Pasteur's statements was: (1) That these germs must be prevented from getting into wounds during and after operations and that they must be killed if possible outside the wound; (2) that if they have succeeded in getting into a wound before the case is seen by the surgeon, as in compound fracture, they must be killed if possible before they have had time to spread and secure a footing, and further germs must be prevented from entering the wound afterwards.

Lister's method of dealing with the information gained from Pasteur's work was thus more definite and more drastic than the suggestions of the other two surgeons referred to, and reflects the action of the philosophical and experimental type of brain. He never swerved from his first decision that the aim of the surgeon must be the prevention of the entrance of living germs into the wounds or their destruction, if possible, before they can gain a footing. But it will be seen that as time went on he found that it would suffice under certain circumstances, especially in the interval between the dressings, to inhibit their growth without necessarily killing them. That his suggestion was the most fruitful of the three is evident from the further course of events.

On further consideration of the various ways of commencing this work it seemed to Lister that it would be best to select cases where the germs had had an opportunity of getting into the wound before the patient came under treatment, but where only a short time had elapsed since the injury, so short that the germs had probably not yet had time to gain a firm footing. Such cases were compound fractures, where the patient comes under the surgeon's care shortly after the accident, with the wound already infected, cases which were notoriously extremely dangerous, large numbers of patients with compound fracture dying of septic disease. In a vast experiment affecting the whole domain of surgery, such as the facts suggested to Lister, the responsibility of the surgeon was at the beginning, of course, very great lest instead of doing good he should make matters worse, but in compound fractures the prospects of the patients could hardly be made worse, and there was a very considerable chance that they might be much improved. And, in addition, the experience that he would gain in treating compound fractures might help him in dealing with operation wounds, which was a larger and much more complicated problem. Besides, except in very urgent cases, operations through unbroken skin could be delayed till he saw what happened in compound fractures.

As regards the procedure, all the laboratory experiments on fermentation and spontaneous generation had so far depended on the employment of heat to kill the germs or on filtration of the air to remove them; but neither of these plans seemed suitable for the present purpose, and therefore Lister turned his attention to chemical substances in the hope of finding one which would kill germs without seriously injuring the tissues exposed in the wound. Curiously enough, during 1864 he had been attracted by a notice in the newspapers about the remarkable effects on the sewage of the town of Carlisle by the use of carbolic acid, a small quantity not only preventing the smell, but also apparently destroying the entozoa which usually infected cattle fed on the pastures on which the sewage was placed. Prof. Anderson obtained for him a supply of this acid, which was sold under the name of German creosote. This substance was very impure and did not dissolve at all well in water—in fact, Lister stated at first that carbolic acid was not soluble in water, but later on, when he got a purer specimen, he found that it dissolved readily enough up to as much as 1 part of the acid in 20 parts of water, and in linseed oil in almost any proportion, but that the oily solution did not seem nearly so active as the watery one was.

It so happened that Lister had to wait a considerable time before suitable cases for his purpose were admitted to the wards. In fact, he had to wait something like ten months before his first real attempt at treatment was made. While we are waiting for the case of compound fracture to come into the ward I may occupy the time by giving you some account of the man himself and of the chief influences on his life.

LISTER AS A MAN.

I like to think of Lister, with his courtly manners and indomitable courage, as one of the knights of olden times sallying out single-handed to find and destroy a formidable enemy, armed with a great but imperfect generalisation or rather working hypothesis and a bottle of crude carbolic acid so impure that he tells us in his first paper that carbolic acid was insoluble in water. He had never seen the enemy, but he saw his ravages on every hand; he did not know how he acted in producing diseases; he did not know where he lived or how he lived. All he knew was that he was probably a unicellular body belonging to the vegetable kingdom and of extreme minuteness, not exceeding more than 1/20,000th of an inch in diameter. He knew nothing about the protective arrangements of the body so much spoken about at the present time. It is, I fancy, well that he did not, for he would have been so bewildered among the various ways in which it is supposed that the enemy on the one hand and the animal forces on the other act, that he would not have known where to strike and he might have failed completely. All that he cared for or needed to know was that he had a terrible enemy who, however, probably had his vulnerable point, and that the gain was so great if the battle were won that it was well worth while to devote his whole mind and his whole energies and his whole life to the solution of the problem.

And it was a great fight, not merely in studying the tactics of the enemy and in devising better and better means of preventing his access to the wounds and in counteracting the effects of his growth and multiplication, but also in overcoming great and unaccountable prejudice, ridicule, and obloquy. This fight was one which few could have carried out to its end, but Lister's profound conviction of the truth and value of what he was battling for—viz., the abolition of sepsis on the lines laid down in his writings—and of the enormous benefit to mankind if the problem were successfully solved, enabled him to put prejudice and ridicule aside and leave the verdict to the future. But he was much helped by a variety of circumstances.

He was mentally well fitted for the task which he had undertaken. He had one of the attributes of genius well developed—viz., that he did not overlook apparent minutiæ. Nor was he led away by the absurd copybook proverbs—"There are exceptions to every rule" and "The exception proves the rule." If he found an exception to a supposed rule he wanted to know why; he did not pass it over as if it were merely an exception and of no consequence. Pasteur

had this faculty perhaps still more developed and Koch in a lesser degree,[4] and with all three some part of their success depended on the fact that they were not content to regard deviations from the ordinary course as trifling but wanted to know why these deviations occurred, and in doing so came across unexpected and helpful information.

Lister's Conscientiousness.

Further, Lister had a very logical brain and a very open mind, he was ready to modify his views and plans at once if proper evidence demanded it. He was full of sympathy for suffering and would devote himself to the relief of a patient without consideration of time. I think that probably his greatest characteristic was his conscientiousness. Before he took action on any point he turned the matter over and over in his mind so as to be as sure as possible that his action was right. His conscientiousness had a very curious result as regards his public appearances; indeed, he became rather notorious for being late when he had an important address to give, the reason being that on thinking over what he wished to say something was apt to occur to him at the last moment which he thought he ought to verify before he spoke. I remember when he gave the Bradshaw lecture here that the Council assembled, but there was no sign of the lecturer, and at last they filed into this room and took their places so as to calm the audience, but he was still missing. I was sitting on the back benches, and spying me, messengers were repeatedly sent up to me to ask what had happened to Lister and if he was coming; I could only say that I had left him at 3.30 and that he was then quite ready, but sure enough at the very last moment something struck him which he felt that he ought to look into before he came down.

I have been told that on one very important occasion, when he was giving an address on coagulation of the blood, an idea occurred to him in the carriage on his way to the lecture hall and that he turned into a butcher's and had an animal killed and the observation made before he went on to his lecture. And in his private practice I have known him to be an hour or two late for a consultation, and sometimes when he ought to have been at his house for his appointments he would look in at his nursing home in passing, and if anyone said that they did not feel quite comfortable he would take off his coat and readjust dressings or splints quite regardless of the fact that his waiting-room was full of irate doctors and patients vowing that they would never consult him again.

Family Influence.

But apart from his own endowments which he was constantly improving by hard work, he was one of a family of exceptionally able people. Especially did he owe much to the influence of his father, who was especially interested in optics, which were his chief hobby and recreation; indeed, it was he who developed the achromatic lens, and for his work in this direction he was elected a Fellow of the Royal Society. In Godlee's charming life of Lister he reproduces much correspondence which took place between father and son and which shows their great intimacy, the care with which he kept his father acquainted with all the work that he was doing, and the wise counsel which his father gave him.

And then the whole-hearted way in which his wife entered into all his work and acted as his intimate adviser and secretary was quite invaluable for Lister. Lady Lister was the eldest daughter of Mr. Syme and they were married in 1856. She was one of the most beautiful characters one can meet with and she was an ideal wife for Lister. A similar Lister Memorial Fund to this has recently been established in Canada, and the first Lister Memorial Oration was delivered last year by Dr. John Stewart, who was one of those who came with Lister to London in 1877 to help in organising the ward work. In his excellent address I find a few remarks about Lady Lister which I cannot refrain from reproducing here, and I am sure with Dr. Stewart's full approval. I assume that the words which I am going to quote were spoken at the wedding feast in a speech of congratulation to the newly-married couple by Dr. John Brown, author of "Rab and His Friends" among other essays, a well-known, learned, and much-beloved physician in Edinburgh. Dr. John Brown, in his remarks, referred to an illness which Lady Lister had suffered from when a little child and in which she had lain unconscious for several days. He spoke as follows: "Lister is one who, I believe, will go to the very top of his profession, and as for Agnes, she was once in Heaven for three or four days when she was a very little child and she had borne the mark of it ever since." Nothing more beautifully and more truly expressive of Lady Lister's character could be said than that. She was a true helpmate, spending hours with Lister, helping him in his scientific work, and taking notes for him; indeed, the notes of Lister's experiments which he has left behind him are for the most part in Lady Lister's handwriting.

Other Influences.

Apart from the above factors, Lister was much comforted by the approval and interest of men whose opinion he especially valued. In his early days two of his teachers at University College, London, had a great influence on him—viz., Prof. Sharpey, the physiologist, and Prof. Wharton Jones, the professor of ophthalmic surgery, but the man who had the greatest influence on him was Prof. Syme. Lister had the very highest opinion of Syme as a man and as a surgeon, and the fact that Syme approved of and latterly became enthusiastic about his work was an immense gratification and encouragement to him and enabled him to ignore the captious criticisms of his opponents.

And then lastly, and by no means least, he was much encouraged by the enthusiasm of his pupils. I do not know of anyone who excited such enthusiasm and had such influence over his students as Lister had, especially in Glasgow and Edinburgh.

METHODS EMPLOYED AND RESULTS OBTAINED.

I have now mentioned some of the chief influences which helped Lister to undertake and carry to success the battle against sepsis, and having waited long enough now for the case of compound fracture to turn up I may say something by way of example about the methods employed and the results obtained. I think that the way in which he commenced his campaign is most characteristic of his conscientiousness and care in all his work. Most men, I fancy, having arrived at the conclusions to which Lister had come would have been on tenterhooks to try the methods and would very likely have applied them to any case which seemed at all suitable, very possibly with disaster and disillusionment. But Lister had patience to wait till a suitable case for the experiment turned up, and I believe that during that time he was further planning out his campaign and also repeating some of Pasteur's experiments and devising some of his own.

His first case of compound fracture did not come under his care till March, 1865, but no details are given, and all that Lister says about it is that "it proved unsuccessful in consequence, as I now believe, of improper management."

I need not go into the 11 cases which he published in his first paper; the results presented a great contrast to those that he had been obtaining pre-

[4] To change my metaphor for the moment the work of these three men was needed to construct the building properly, and Lister conceived and carried out its erection, Pasteur laid its foundations "well and truly," and Koch assisted very materially by his work on disinfection and also in clarifying the structural details by his first work on infective disease of wounds and no cultivation of bacteria on solid media.

viously.[5] I may, however, mention one or two observations that he made on these early cases which were new to him and of the greatest interest and importance.

In the first place, these cases gave him a high opinion of the value of carbolic acid for his work; indeed, it is very interesting that this substance, chosen more or less at haphazard, has turned out to be the most useful all-round antiseptic. The cases specially referred to are the second and fifth cases in his first publication. Put shortly, only two of the 11 cases developed phagedænic gangrene, a smaller proportion than usual, but the point that he makes is that in the one (No. 2) the disease developed after he had left off the use of the carbolic acid which he thought had done its work, and in the other (No. 5) it broke out at a small wound which had been overlooked and had not been treated with carbolic acid at all; it had spread from this little wound to the lower part of the bigger wound before it was noticed. In both cases recovery took place, but after a long struggle.

Healing by Blood Clot.

More important was the behaviour of blood clot in aseptic wounds; this was quite new to Lister. He mixed up carbolic acid with the blood and torn tissues and thus left a mass of coagulum and shreds of tissue in the wound, and several points quite new to him were observed. He noticed that the clot did not contract and break down as he was accustomed to see it do but remained firm and adherent to the sides of the wound.

That was the first fact; now for the second. On taking out a piece of the clot after some days and examining it under the microscope, he found that it contained numerous connective-tissue cells, some in bundles; later on blood-vessels began to develop. A third fact was that pieces of dead tissue mixed up with the clot also became infiltrated with these connective-tissue cells, so that not only did organisation occur in the dead clot but also in the more substantial pieces of dead tissue as the result of the penetration of these connective-tissue cells into them and the subsequent disappearance of the dead tissue. This last fact was what chiefly led Lister to take up his work on catgut and ligatures generally. And a fourth fact was that in some cases after two or three weeks one would find the edge of a thin layer of clot on the surface could be lifted up, and on doing so a layer of epithelium was disclosed spreading over the clot just below the surface and completing the process of cicatrisation.

These points constitute the process of healing by blood clot which we have taken advantage of ever since in cases where we could not conveniently bring the edges of the wound together. Curiously enough, this point seems to be lost sight of almost completely at the present time. The other day I picked up copies of four recently published books on general surgery and in only one of them was there any mention of organisation of blood clot. This is a pity, because it is a most useful thing, but for the reasons which I give towards the end of the appendix I doubt if exposed blood clot could be kept aseptic for a sufficient length of time to permit organisation where the technique of the surgeon excludes the use of chemical antiseptics.

Before passing on I may just call attention to the application of his method to an operation wound. As the case is referred to in the appendix I need not go into details here, but I may say that having squeezed out the pus from the abscess (it was a spinal abscess) he mixed it up with the carbolic acid to form a paste with which he dressed the wound. Just imagine the horror of the laboratory bacteriologist at such a suggestion at the present day! Nevertheless, when Lister came to dress the wound next day, prepared to make a paste in the same way as he did the day before, he was astonished to find that there was no more pus and that all that he could squeeze out of the wound was one or two drops of serum! The history of the case is that it remained aseptic and ultimately made a complete recovery.

LISTER'S CLINICAL LECTURES.

I may now pass on to the beginning of the session 1872-73, when I first became acquainted personally with these matters in a curious way that may interest you. I began the actual study of medicine in May, 1871, and devoted myself for the first 18 months to botany, natural history, and chemistry. In October, 1872, when I was in my second year, I took out the classes of surgery, physiology, and anatomy. There was an interval between the classes from 12 to 1 o'clock and I did not know what to do with myself during this interval. My lodgings were a considerable distance away and there was no object in walking there and back; what I wanted was shelter from the biting east winds and the wet. At that time there was no students' club at Edinburgh as there is now, and the only thing I could think of was to go and sit in the general library. But it was small and crowded with students of all faculties and there was no chance of a shy youth like myself getting a seat. So it occurred to me that I might as well take out my hospital ticket in October, 1872, as in the following May, which would be the usual time; in going round the hospital I might learn something, and anyway I would get shelter from the wintry blasts between noon and 1 o'clock.

I shall never forget the first day that I went to the hospital. At 12 o'clock I crossed the road to the infirmary and found crowds of students hurrying along the lobbies, a good many indeed running. I joined the company, full of curiosity, and found that we were going to Lister's clinical lecture. We ultimately reached the large operating theatre and found it filled with men crowding the gallery and standing at the back and in the gangways; there must have been over 200 there, and they were senior men, for the clinical surgery class was not usually attended till the fourth year. I should think that I was the only one of my year there. Presently a man walked into the arena, sat down on a chair placed on the floor of the theatre, and crossing his legs and putting his right hand on his thigh he began his lecture. This man was Lister. He had not spoken many minutes before I became fascinated with the subject and could not help seeing the wonderful era that was dawning for surgery. I had my notebooks for the other classes in my hand and I started to take down what he said, and as he spoke very slowly and clearly and I scribbled very quickly, I was able to take down practically the whole lecture, though, not having learnt any surgery, I did not understand it at all clearly at first. But what a contrast with the lectures on systematic surgery! Very dreary performances, full of curious theories about the reactions of the body and inflammation, quite unintelligible to me, evidently something which

[5] As a matter of fact, Lister overrated his first success because at that time he looked on the presence or absence of *putrefaction* as the criterion of failure or success—and most of the cases were free from putrefaction. It was not till later that he adopted *suppuration* as a truer criterion as regards sepsis, for septic diseases might develop in connexion with a wound that was suppurating but the discharge from which was not putrid. The absence of suppuration is a much more useful test of asepsis than the absence of putrefaction. Even the absence of suppuration may theoretically not be an absolutely true guide, for cases of erysipelas occur without suppuration, and it is conceivable that tetanus might do so also. But taken as a whole the presence or absence of suppuration is quite satisfactory as a test of failure or success as regards asepsis. On this criterion I find that five of the 11 cases in Lister's first paper were typically aseptic cases, five were septic, and in one the sepsis seems to have been very slight indeed. Surely that is a very remarkable result for a first attempt in cases where it must always be a matter of doubt whether one has satisfactorily disinfected every recess of the wound or not. I have no hesitation in saying that up to that time Lister had never seen five cases out of 11 running an aseptic course, indeed I doubt if he had ever seen one. As to mortality, of these 11 cases only one died (from perforation of the popliteal artery by a spicule of bone on which it rested, 3½ months after the injury), a mortality of 9 per cent., a very low mortality as cases went at that time.

had to be memorised but nothing to think about. And then at 12 o'clock, simply seeking shelter from the "cauld blasts o' Auld Reekie," and not knowing that I had met my fate, I became entranced by the wonderful vision laid before us by Lister.

Is it any wonder that I left the theatre an enthusiast for the profession that I had chosen, and that on lecture days I was one of those who ran? An enthusiast I still remain. On my way home that first afternoon I bought a superior notebook into which, as soon as I got home, I copied out my notes of Lister's lecture and all that I could remember, looking up the words I could not understand in my text-book on surgery. This I continued to do after every lecture, and this notebook, containing Lister's lectures for the winter session 1872–73 and part of the following summer session, I have presented to this College, and it will be found with the Lister relics if anyone cares to look at them.[6]

I always consider that it was a lucky thing for me that there was no students' club at the university in my time, for had it existed I would most probably have gone there for this vacant hour, and possibly learned billiards, but I would not have attracted Lister's notice, and I would not have been delivering this lecture here to-day. These comforts, especially for young people, are not always for the best. I am not at all sure that the youth of the present day do not have things made too comfortable and attractive for them, for this is apt to take away some of the incentive which is very necessary for hard work.

Rivalry between Listerians and Non-Listerians.

At that time, and till Lister left Edinburgh, the rivalry among the students—between Lister's followers and those who continued the old system—was very marked. The Listerians, who were considerably the more numerous, looked on the non-Listerians as lost souls, Tories of the most die-hard description, and not likely, when they came to practise their profession, to be able to give their patients the best chance possible. The non-Listerians, on the other hand, looked on the others as crazy believers in vain things like germs, rash to a degree, blinded with their enthusiasm, placing their patients in the greatest danger by the outrageous treatment that they proposed, and, as they said that their wounds did not suppurate while those of the other side did, liars of the first water. This rivalry increased for a considerable time, and when I became Lister's house surgeon in Edinburgh in 1876–77 it was probably at its height. It was, I believe, of the greatest value to the cause of asepsis. It made us all extremely careful, because we knew that everything we did was closely watched and no excuses would be accepted if a case went wrong; it would be the principle that would be blamed and not the individual. By this time the antiseptic treatment had reached a stage where we felt that suppuration should not occur in an operation wound made through unbroken skin; if it did occur—and as we were not perfect, one or two cases would suppurate during the six months' session—we all felt it very much; we went about as if everything were lost, ashamed to raise our heads and subjected to merciless chaff. Our only topic of conversation among ourselves on such occasions was how the infection had got in, what was the error in technique which had been committed, and whose fault it was; most excellent training and never forgotten; nothing could make us more careful than to be made to feel that suppuration in an operation wound was due to some error in our technique and was a serious reflection on the surgeon or the dresser. And I do not hesitate to say that I still agree with this axiom, and that in my opinion it holds true at the present time just as much as it did in the old days.[7]

Lister's Methods Studied by Distinguished Foreigners.

By this time (1872 onwards) Lister's work had attracted more and more attention and quite a number of surgeons began to visit Lister's wards. Curiously enough, very few British surgeons were to be seen, but other countries were well represented, especially Germany. Lister made a special point of showing all his methods and results to the visitors, and as there were constantly fresh arrivals he had to repeat his story frequently; thus his hospital visits were somewhat prolonged. In the early days to which I specially allude the steam spray had not yet been introduced and it was very hard work to keep a hand spray going for any considerable time. The dressing of a patient followed a regular routine, the dresser on duty got on his knees at the side of the bed and as soon as the bandages had been cut he started his hand spray. Lister then lifted off the outer dressing, which was solemnly handed round to each distinguished foreigner to smell. Having satisfied themselves that there was no putrefaction the deeper piece of gauze which was generally placed over the region of the wound was passed round to show that there was no pus, and then in cases where it had not been possible to bring the edges of the wound completely together and where blood-clot could be seen in places between the edges of the incision came the *pièce de résistance*. In such cases Lister usually covered the wound with a piece of material which was impermeable to carbolic acid and which he called "protective," and when this was exposed he would take a pair of forceps and peel off the protective exposing the wound with the adherent organising blood-clot lying in the spaces where the edges had not come together, solid and firm, and with no sign of inflammation or suppuration in the wound. As a rule, this was followed by a sort of gasp of surprise by the distinguished foreigners, and then a violent conversation would break out among them accompanied by equally violent gesticulations so that one became alarmed lest the peace of the nations was going to be endangered. The poor dresser, who was almost, and indeed sometimes actually, faint from the pumping of the spray, was for the time being completely forgotten. But however exhausted he was, and however much his wrist and arm ached, not one of his dressers would give in and let Lister down.

New Operations and New Lines of Treatment.

I have described in the appendix the stage which the methods of treatment had reached by this time, and for some years Lister was probably most interested in revising the operative treatment of every disease or injury that presented itself from the point of view that he need not now fear sepsis in the operation wound. I have also referred in the appendix to the first case of badly united fracture at the ankle-joint which he rectified by open operation, opening the ankle-joint freely. At first he did more bone work

[6] In his lectures Lister tried to show and discuss examples of as many different surgical diseases (even the simplest) as came to his clinic, so that in the course of the session the students had seen a considerable variety, especially of the ordinary cases which turn up in private practice. In my notebook we find among other things spinal caries, varicocele (with operation), epulis, spina bifida treated by drainage, suprapubic lithotomy (probably the first case performed for many years), excision of elbow, simple fracture, burns, ununited fractures with operation, stricture of œsophagus, stricture of the urethra, malignant tumours of jaw, nævus, hypospadias, cancrum oris, fistula in ano, strangulated hernia, &c.

[7] Not long ago I came across the following very suggestive passage in a paper by Dr. Thomas Keith, one of the great pioneer ovariotomists, on Ovariotomy Before and After Antiseptics (Brit. Med. Jour., October, 1878): "The regulations made in some hospitals that every visitor must sign his name in a book declaring that he has not for a week visited any case of infectious disease or attended a post-mortem examination, before being admitted into the operating-room, has always seemed to me to be meant for a sort of *plaisanterie*. For my own part, when a case goes wrong after an operation, I have seldom to look far beyond myself for the cause of failure—something done, something not done. This is a lesson hard to learn; we blame persons, things, accidents, and circumstances rather than ourselves.

than anything else, ununited fractures, badly united fractures, deformities of bone (he was the first to operate for knock-knee, very much on the lines of operation devised by Sir William Macewen some time later), wiring or pegging recent fractures—e.g., fractures of the patella or olecranon, operations for varicose veins, open radical cure of hernia, extensive operations for cancer of the breast, and so on. He was the first to resuscitate suprapubic lithotomy, though this is generally attributed to others. In fact, his remarks on this matter will be found in my note-book, where you will see his reasons for this suggestion, but he was not very happy in their practical application.

About this time (1873 onwards) Lister's activities followed two great directions, which are both traced out in the appendix. In the first place, he continued his efforts to find fresh antiseptics which might be less irritating and more useful than those which he had hitherto employed, and he spent a great deal of time in testing various substances which were brought to his notice; and the other line of activity which he followed was to reconsider the treatment of all sorts of cases which came before him from the point of view of whether something better might not be done for them by operation than was being done at that time, founded on the knowledge that sepsis might be reckoned to have now been entirely abolished from wounds made by the surgeon through unbroken skin. It was probably in that direction more than in any other that Lister's work became so intensely interesting to the students. They would come to his wards and see treatment employed which had apparently never been heard of, or thought of, by the other surgeons who did not employ antiseptic measures. It would be hopeless to attempt to give any sort of list of the new operations which Lister did, and he himself absolutely declined to publish them.

When I became more intimately associated with Lister I made repeated requests to be allowed to publish notes of his clinic, especially of the new operations and new lines of treatment which he was employing, but although he had done that sort of thing for Mr. Syme, he pointed out, quite correctly, that the matter was very different, and that if such cases as opening joints, complicated operations on bones, and many others that might be mentioned, were published and shown to have much benefited the patients, it might quite well happen that some surgeon who was not a believer in antiseptic treatment, or who was not sufficiently acquainted with the technique, might proceed to perform an operation on similar lines, and being without the protection of antiseptics the patient might lose his life or limb as a consequence. That is the explanation why so little is known of Lister as a surgeon. But, as I said before, I think that it was his fresh outlook on treatment and the interest of speculating what fresh procedure Lister would suggest in a particular case that fascinated the students most. The only sphere of operative work in which he did very little was abdominal surgery. Indeed, with the exception of ovariotomy, which was, curiously enough, supposed to be a very difficult operation and one sacred to a few specially gifted men, comparatively little work had been done in abdominal surgery as we now know it before Lister retired from practice, and he openly stated that he did not feel justified in embarking on surgery in a region with which he was not thoroughly familiar.

ENTHUSIASM ABROAD.—MIGRATION TO LONDON.

I became Lister's house surgeon in Edinburgh in October, 1876, having spent the greater part of a year in Vienna and Strasburg, and I may say that in my visit abroad I found the greatest enthusiasm over Lister and his work. Indeed, the fact that I had worked in his wards and was going to be his house surgeon on my return to Scotland was a sort of open sesame, and one of the professors actually asked me to come and show him exactly how Lister dealt with his cases.

It was in the spring of 1877 that Lister received and ultimately accepted an invitation to go to London as professor of clinical surgery at King's College conjointly with Mr. John Wood. The first that I heard of it was one Sunday morning, I think a day or two after he received the invitation, when I was sleeping quietly in the house surgeon's bedroom. I woke up to find someone shaking me, and to my astonishment on opening my eyes I found that it was Lister. He told me about his invitation to London. He had not yet at all made up his mind about it, but he said that if he went he would need to take a small staff with him familiar with his methods and he had come down that morning to know whether if he decided to go I would go with him and again act as his house surgeon for six months at King's College Hospital. Go with Lister to London! I could not believe my ears! Of course I would go with him to London or anywhere else. One would have thought that he was asking me to do him a great favour instead of giving me the chance of a lifetime. In addition he took Dr. John Stewart (now one of the leading surgeons in Canada and held in very great esteem there), Dr. W. H. Dobie, of Chester (in large practice there), and Dr. Altham (who died soon afterwards) as clerks.

Whether Lister was wise in leaving Edinburgh is still open to question, but his decision to go to London was most characteristic of the man. It was merely a question of suffering humanity. His methods and views were spreading very slowly in this country, and after long consideration it seemed to him that they might be sooner adopted if he were in the great centre. But his heart was in Edinburgh where he had everything that he could desire—many devoted friends, delightful society, enthusiastic and large classes, and a large surgical clinique, but where, as he thought, humanity called him he did not hesitate to place the call of duty above the call of pleasure.

He arranged to begin his work there at the beginning of the winter session in October, 1877, and he was asked to give the address at the opening of the winter session. At that time he had become very interested in the question as to whether there were different "species" of bacteria each with its own actions, whether on fermentescible substances or in connexion with diseases, and he looked on this as a very important matter. He had already been working with milk, and he decided to investigate the lactic fermentation of milk, which he did during the summer and autumn of 1877. He satisfied himself by many ingenious experiments that a small bacillus, to which he gave the name of *Bacillus lactis*, was the only cause of the lactic fermentation of milk, and that that was its sole external function in the scheme of Nature. The research was carried out with the precision and thoroughness which characterised all Lister's work. He not unnaturally thought that the absolute demonstration of a specific bacterium, explaining much that was obscure at that time, would be of the highest interest to his audience. Large numbers of the leading surgeons in London and the provinces came to hear this lecture. Perhaps, not unnaturally, they expected to be told about the revolution in surgery which Lister had inaugurated, and instead they had to sit for an hour listening to details of a series of experiments which proved that the lactic fermentation of milk was due to a particular bacterium! The expression on the faces of the audience was very interesting and rather amusing; the majority of the surgeons present could not understand what the lactic fermentation of milk had to do with surgery. Those were the days of the "practical surgeon" as opposed to the "scientific surgeon," the latter being supposed (why I cannot imagine) to have no practical skill or knowledge. It took a considerable time before the "practical surgeon" realised that his day was past.

LISTER'S VIEWS UNFAVOURABLY RECEIVED.

When we arrived in London, as far as I can remember, no one at King's College was doing anything specially in the direction of antiseptic work, and, indeed, only a very few surgeons in London. As regards Lister's lectures, the chief thing that struck us at once was the almost entire want of enthusiasm among the students as compared with Edinburgh; there was no crowd running to get a good seat. Apart from Lister's dressers, only a few students would stroll into the theatre quite casually, apparently taking little interest in the lecture and seldom taking any notes. After the enormous classes in Edinburgh and their great enthusiasm it was very disappointing and depressing. We found after a time that probably the main cause of this was that the examiners in surgery for the various diplomas and degrees were for the most part not favourable to Lister's views, and the students were therefore afraid to attend Lister's lectures in case they should by accident give his views to the examiner. A good many of them, however, planned to stay in town for some time after they qualified so as to see something of Lister's work. This state of matters continued for some time, but gradually died away.

Lister was quite well received by the staff and the students, but the nursing department was very difficult to work with. The hospital was at that time nursed by a sisterhood who looked on the wards as their private rooms, into which no man should come without their permission, nor should he interfere with any of their arrangements such as ventilation, &c. They could always produce a rule of their sisterhood why we should not do this or the other thing which we considered essential for the success of our work. Had we not possessed a keen sense of humour (being more or less of Scottish descent), I do not know how we could have got through, but most of the restrictions were so childish and so evidently invented on the spur of the moment that we could not but laugh at them. I believe the real trouble was that till we appeared on the scene the nurses dressed the wounds, but when Lister arrived he naturally would not allow them to meddle with the dressings; this solution did not occur to me for some considerable time.

The staff, on the other hand, were quite cordial and interested. Not long after we arrived one of the surgeons was going to amputate a limb, and he asked me to come and look after the antiseptic arrangements. His technique was pretty defective, and he did not seem able to visualise the germs which were ready to seize every opportunity of getting into the wound, so I accidentally from time to time squeezed a quantity of carbolic lotion over his hands, for which I was, of course, very apologetic. He did everything that I suggested till it came to tying the vessels, for which he used silk and left the ends long. I begged him repeatedly to cut them short and told him that they would never separate if the wound remained aseptic, but he was adamant; he had never seen a case where the ligature could not be pulled out after a few days and he was not going to carry out such stupid advice as to cut them short. The wound healed by first intention except where the bunch of ligatures was, and no suppuration occurred. Day after day I dressed the case for him and he pulled the threads without success. Gradually he began to think that I had told him the truth, and ultimately I got him to pull the threads as far down as he could and cut them off as high up as possible. This he did, and fortunately, as I had taken special pains to keep everything aseptic, no infection took place and that end of the wound was healed in a few days and no further trouble resulted.

DISCOVERY OF AN UNIRRITATING ANTISEPTIC.

At the time of the migration to London we were still using carbolic gauze, carbolic spray, and carbolic lotions, and although thymol, eucalyptus, and various other antiseptics were tried during the next four or five years no real progress was made in the way of substitution of antiseptics till after the publication of Koch's work on antiseptics. After that Lister took up various mercurial preparations, and a variety of gauzes impregnated with preparations of mercury were employed which had all to be discarded after a time on account of irritation of the skin. Ultimately Lister examined a double cyanide of mercury and zinc and this was found to be unirritating, being insoluble in water. But it was effective as an agent to inhibit the development of bacteria though possibly not to destroy them. It was soluble in the mixture of serum and blood which came from the wound in sufficient amount to render it an unfit soil for the growth of bacteria. This we have used ever since with quite satisfactory results, and I believe that it just fills up the loophole which is left where dressings which are simply sterilised but do not contain any antiseptic are employed. Where a large amount of discharge is expected I generally reinforce the cyanide dressing by a mass of salicylic wool placed outside it. As to these gauzes and wool, it must be remembered that though they contain antiseptics they must be sterilised in the autoclave also, because the antiseptics are not volatile so that bacteria which may lodge in the dressing are not acted on by the antiseptic. The diluted lotions of bichloride of mercury and of biniodide of mercury (1–2000 and 1–4000) were also largely substituted for carbolic acid, the carbolic spray having been given up in 1887.

LISTER'S ACTIVE WORK ENDED.

Lister's active work in connexion with surgery came to an end about 1893. The death of Lady Lister in the spring of that year, followed soon after by his retirement from the hospital on account of the age-limit, removing at the same time his much-beloved companion and fellow-worker for many years and the opportunity of pursuing his work at the hospital, broke him down and changed entirely the current of his life. But by that time general septic diseases had become practically unknown in his practice in so far as operations through unbroken skin were concerned, and suppuration, even of the mildest type, was an occurrence of extreme rarity, and the possibility of septic complications was quite negligible. He had also reached a point in his technique where the possible irritation caused by the antiseptics employed was not noticeable and did not interfere at all with the healing of the wounds. In 1895 Lister was elected President of the Royal Society, and the work connected with that Society gave him another five years of life. But after that, although honours continued to be showered upon him, the great brain became tired, his memory failed, and he began to long for the time to come when, as he firmly believed, he would meet his wife and his friends again and commence a new life.

THE LATE DR. A. CHRISTY WILSON.—Alexander Christy Wilson, M.D. Edin., the oldest medical practitioner in Doncaster, died on April 27th, in his eightieth year, after an illness of several months' duration. A native of Hawick, he studied at the University of Edinburgh, where he graduated M.B. and C.M. in 1867, having previously in 1866 obtained the L.R.C.S. Edin. While at the University he was a President of the Royal Medical Society of Edinburgh. In 1870 he took the degree of M.D., having in the meantime visited the hospitals in Paris. Settling in Doncaster 55 years ago, he soon established himself in the town. For over 40 years Dr. Wilson was an honorary surgeon at the Doncaster Royal Infirmary, and on his retirement from active surgical duty he became its senior consulting surgeon. He was a past President of the Yorkshire branch of the British Medical Association, and also of the Leeds and West Riding Medico-Chirurgical Society. Dr. Wilson took an active part in all philanthropic movements in the town, and was a warden of St. James's Church. In August, 1923, Dr. and Mrs. Wilson celebrated their golden wedding, and Mrs. Wilson survives her husband. Two sons are in the medical profession. Dr. Wilson contributed papers on abdominal surgery to *The Lancet* and the *British Medical Journal*.

Croonian Lectures

ON THE

RÔLE OF FATS IN VITAL PHENOMENA.

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LECTURE IV.*

IN the first of these lectures an attempt was made to review the ideas that are current with regard to the part played by fats in the structure and life of cells. Confusion, conflict, and nothing but what was unsatisfactory could be found in them. Then certain facts were described of which as yet cytologists have made little use. Some of these facts are capable of being much more clearly defined than they yet are, but are then, it was suggested, likely to contribute something, possibly much, to the formation of clearer ideas. Briefly the facts are these. Simple fats, triglycerides, have some 50 paraffin carbon atoms, arranged in three parallel rows, for six to which some hydrophile properties have to be assigned. It is these latter that enable fats to form films on water which paraffins cannot. Lecithine, with perhaps 34 paraffin carbon atoms, in two rows, attached to a much larger hydrophile group, presents in this group, in addition to the glyceryl ester arrangement of the simple fat, a free phosphoric acid hydroxyl and a free basic hydroxyl in choline. It has thus 30 per cent. less of the paraffin and an incalculably greater hydrophile component. It is still insoluble in water, but in contact with water behaves totally differently from simple fats, in such a way that ideal equilibrium would appear to be unattainable until the lecithine molecules were arranged in films two molecules thick with the hydrophile groups facing the water on each surface. Against the attainment of such an ideal equilibrium many intercurrent tendencies must operate; the presence of other substances in the aqueous phase, as well as the admixture of other lipines and of cholesterol with the lecithine, is bound to introduce complications. Indications indeed of the influence of cholesterol have been obtained already in what makes no claim to being more than a tentative exploration of the subject. Many attempts, which have not been referred to, have been made to pick up clues as to the influence of other substances in both phases, but many more remain to be made. Nor can it be claimed that as yet any serious call on technical ingenuity has been made in the pursuit of the inquiry. An attractive prospectus could be composed.

At any rate we cannot be satisfied merely with the two ideas as to the state of fat in cells, which are all that is usually offered, an emulsion of oil in water, with possibly an aggregation of fat at the cell surface. With these alone no sense can be made of the diphasic cell systems. It would be blasphemy to suppose that it could. Such complacent irreverence in the contemplation of the supreme mystery of the structure of living protoplasm would be unphysiological, unscientific.

IS THERE STRUCTURE IN PROTOPLASM?

In what sense is it possible to speak of structure in protoplasm? Much of what used to pass as evidence for such structure has been shown, notably by Hardy, to be fallacious. The fixatives used in histology produce similar appearances in colloidal solutions of mere common proteins. The intriguing networks and fibrils have gone; the Nissl granules have melted away. Were it not for the solid work in the micro-dissections of American cytologists, Barber, Kite, Chambers,[1] and others, who knows whether our faith in the reality of mitotic figures or even the nucleus were not in danger?

Liquidity of Protoplasm.

Protoplasm is liquid. Reaffirmation of this fact, which has sometimes been lost sight of, is now rightly held to be necessary. Much of the evidence on which it rests has long been available, much more has come to light in modern investigations. By exposing cells, especially egg cells, to centrifugal action Lyon (1907)[2] showed that their contents take up new positions, determined apparently solely by exaggeration of the force of gravity. Oil globules appear confined to one end; pigment granules and other inclusions congregate at the other; between the two is a clear hyaline zone, in which the nucleus lies near the oil globules, while at the edge of the opposite granular zone the smallest of the granules can be seen in active Brownian movement. Brownian movement, it is well known, is frequently observed in cell protoplasm, including that of nerve cells (Marinesco[3]). It stops when the cell dies, but also at other times during the normal life of the cell. In addition to the evidence from Brownian movement there is that which can be derived from the observations of streaming movements in protoplasm, some of which date back to the days of Corti and Treviranus. Among the most striking of these observations are still those of Arthur Lister[4] (1888) on the rhythmically reversed flow of granules in the protoplasm of mycetozoal syncytia, for some seconds first in one direction, then slowing down, stopping, and starting again in the other, and so repeated indefinitely. Such syncytia, too, he observed as he made them creep through a cotton-wool filter in which the ingested vegetable spores were found to have been strained off as the organism emerged clear as water on the other side. What kind of structure can such protoplasm have? Similar to these are the descriptions of streaming movements in the pseudopodia of amœbæ, towards the apex of the pseudopod in its axis, in the opposite direction on its surface; these movements Chambers (1920) was able to modify by injecting fluids into the cell; he speaks of them as "depending upon a delicate balance of liquefying and solidifying tendencies in its protoplasm." Currents have been described also in the dividing egg, in nerve cells, in epithelium, and in cells of the pancreas; in fact, new observations of this phenomenon are continually being added to the old ones. That protoplasm is liquid is again argued from the fact that included drops of liquid are not prevented by any rigid structure of the surrounding protoplasm from taking up the spherical shape that would be given to them by their own surface-tension. Carlson,[5] too, measured the time taken for an impulse to travel in a certain nerve of the slug, when the animal's body was contracted and when it was extended. The result showed that the nerve elongates and does not merely uncoil itself as the animal is elongated. The consistency of the nerve fibre must be much more fluid than probably had been commonly supposed.

VISCOSITY OF CELL SUBSTANCE.

But if protoplasm is liquid how can it have structure? Going back again to the earliest descriptions of cell substance, it is familiar that it was spoken of as a sticky, viscous fluid. In modern investigations the viscosity of protoplasm has received much attention. Cell protoplasm will adhere to a micro-dissection needle and can be drawn out in a long strand, which may become detached from the cell, or if released is retracted. In either case the original appearance of the cell may be restored. An amœboid cell may adhere to the surface over which it is moving, so that portions become detached and are left behind as the cell moves on. Some cells like the motor nerve cells in the frog are so tough that it is difficult to

* Lectures I., II., and III. appeared in THE LANCET of April 18th and 25th and May 9th respectively.

dissect them at all; others like those of the pancreas break up if merely pricked. The viscosity of cell substance is known to vary significantly at different times in the life of the cell. These variations have been studied by the effect of centrifugal action. The viscosity of the egg protoplasm has thus been shown to be increased after fertilisation (Heilbrunn,[6] Odquist[7]). If an egg of which the contents have been stratified by centrifugal force is then fertilised, no Brownian movement is observed till shortly before division, when it starts at the region where a few seconds later the cleavage furrow begins to appear. By micro-dissection these viscosity changes in the recently fertilised egg have been studied in greater detail. It is high in the radially marked cytoplasm round the clear centrosphere, high when the chromosomes are arranged about the equator; but when they have separated and the amphiaster is formed the viscosity of the equatorial region is low, and a needle can move about in it much more freely than in the cytoplasm elsewhere. In some cells the cytoplasm can be stripped off the spindle and the bare spindle retain its shape. But with two needles it can be stretched, the chromosomes stretching with it, the whole when released returning to the original shape. In some cases the disposition of the parts of a mitotic cell can be visibly changed by mechanical disturbance, the rays of an aster deflected or even made to disappear, and then when left to themselves they may reform, recover themselves, and division proceed apparently normally; as though protoplasm were not only viscous, but elastic in its viscosity because its viscosity depends on a persistent tendency in its components to arrange themselves in it according to an ordered plan. In other cases mechanical disturbance of one part of a cell may result in disintegration that spreads sometimes rapidly to other parts, the integrity of the whole being dependent upon the integrity of the part.

Bayliss[8] described the cessation of Brownian movement of ultra-microscopic particles in the pseudopodia of amœbæ as a result of brief weak electrical stimulation, and how under favourable conditions the effect would pass off and the movement begin again. Such disturbances as are called stimuli may therefore bring about visible changes in viscosity.

Cause of Viscosity of Cell Substance.

The viscosity of cell substance is commonly ascribed to the proteins that it contains. Some colloidal solutions, those of metals or their sulphides for instance, are hardly more viscous than pure water. Considerable amounts of finely divided solids may be suspended in water without its becoming viscous. But while a solution of egg albumin containing 13 per cent., about the amount in white of egg, has double the viscosity of water, one of little more than double that strength is ten times as viscous as water. Other proteins that have been investigated give much more viscous solutions than egg albumin, euglobulin in 13 per cent. solution, for instance, has a viscosity nearly 30 times as great as water, and sodium caseinogenate in still lower concentration the same (H. Chick, 1914).[9]

From facts such as these it is argued that the colloidal particles in a protein solution are not solid. That they are not solid as particles of gold are must be granted, if it is felt necessary to prove that. But when the argument proceeds thus: emulsions, suspensions, that is, of spherical liquid drops in an immiscible liquid, have in certain conditions a high viscosity; therefore the high viscosity of protein solutions must be accounted for similarly; and the particles of protein, since they are not solid as metals are, must be liquid, immiscible with water, and by implication spherical drops, are we bound to follow this argument step by step and accept it all as logically necessary? It must be admitted it is not customary to set the argument out as categorically as this. All that is usually done is to call colloidal solutions such as those of proteins "emulsoid," and leave it at that. An emulsion is something we can understand; a system of two immiscible liquids, one suspended as spherical drops dispersed through the other; where one liquid begins the other ends, and there is a definite interface between the two at which substances dissolved in either may tend to accumulate. What is an emulsoid solution? It is very well to say that the particles of the solute contain some of the liquid, and the surrounding liquid some of the solute in true solution, but in what sense is such a system like an emulsion? Are there two liquids? Is one of them dispersed in spherical drops? Where one begins does the other end? Can we say there is an interface between the two and that all that would follow from that is to be implied? No indication is given as to whether the answer to these questions is affirmative or negative. I venture to think it should in each case be negative. If so, in what sense are such solutions like emulsions? The term emulsoid is merely suggestively misleading; it is not happy; in scientific terminology words ending in "oid" seldom are.

Structure of Protein Molecule.

In endeavouring to understand the viscosity of protein solutions and its bearing on the structure of protoplasm it may be well to think of the stereochemical configuration of a protein molecule. Such a molecule is a chain of amino-acids; in this chain each amino-acid must tend to be set at a certain angle to the one next to it, the angle being determined by the directional forces between the atoms concerned in the linkage, and also probably by attractions and repulsions between neighbouring polar groups. The whole molecule will thus tend to assume, if free to do so, a certain disposition in space of a very complex sinuous pattern. It must be remembered that what are called "straight" chains of carbon atoms in chemistry are certainly not straight; and that the number of amino-acid chains in a gelatin molecule is more than 100, in hæmoglobin nearer 200, containing many ring formations as well as "straight" chains. This pattern, when the protein is in the dry state, cannot be preserved; the molecules are crumpled up and unfold only in solution, if, indeed, having once been dried they can again be disentangled. Dry gelatin expanding in very dilute hydrochloric acid may take up 70 times its weight of water (D. Jordan Lloyd).[10] A coherent gel may be obtained from a solution of gelatin on cooling to 8° C. when the gelatin is only 0·2 per cent., when, that is, the space occupied by the water in the jelly is 500 times as great as that actually occupied by the gelatin (Rohloff and Shinjo).[11] In a gel formed on cooling a solution the gelatin molecules clearly must link up to each other so as to form a complicated meshwork in three dimensions, in which the communicating interstices filled by water far exceed in volume the space actually occupied by the gelatin molecule. This linking of gelatin molecules is, however, not strong enough to stand more than a certain intensity of kinetic activity in the permeating liquid. As this activity increases with rising temperature the linkages are loosened, not everywhere at once, but gradually. At the same time the initial high viscosity diminishes, at first rapidly, then more slowly, till the molecules are not allowed to remain linked up at all. Arisz[12] measured in a 10 per cent. solution of gelatin, which solidified at 44° C., a viscosity at 46° 50 times, at 47° 42 times, at 55° four times, and at 65° twice as great as that of water. The viscosity is a measure of the effective operation of forces that tend to link the molecules together, their stickiness. Something similar seems to be implied in the conception of any emulsoid colloidal solution of a protein with its comparatively high viscosity; the aggregates of protein molecules must arise from the tendency of molecules to cohere, and the aggregates tend to be linked together by the free molecules dissolved in the surrounding fluid, sufficiently at least to diminish the fluidity of the system.

The viscosity of the cell substance may be accounted for in the same way. Indeed, the fact that liquid protoplasm can enclose spherical drops or vacuoles, if it proves that protoplasm has not the rigidity to prevent the shape of the drops being determined by their surface tension, mark the word, and therefore that protoplasm is liquid, proves no less surely that there must be cohesion between the molecules and aggregates of molecules composing the colloidal protoplasmic solution, sufficient to prevent these molecules from being scattered by the kinetic activity of the water molecules among which they float, sufficient, too, to set a limit to the amount of water which they can enclose. Protoplasm is not miscible with water till it disintegrates, because, though liquid, it has structure.

CELL PROTEINS UNOBTAINABLE.

In some of the earliest descriptions of cell protoplasm it was spoken of as a jelly; more recent studies, including those referred to above, lead to the idea of a viscous fluid, the viscosity of which can vary. In any case it would be a mistake to argue from what is known of the behaviour of one kind of protein as to the behaviour of another. No cell protein has been studied as casein, gelatin, egg albumin, or the serum proteins have. Cell proteins cannot be obtained. But the proteins that have been studied behave so differently from each other that it is impossible to predict which of them, if any, a particular cell protein will resemble. They are alike only, it may perhaps be safe to say, in that when in solution they give colloidal solutions which in certain circumstances and concentrations have high viscosity.

If the way in which I picture protein molecules in protoplasm is justifiable, as floated out in the water of the cell, cell proteins may well be thought of as unobtainable. They are put together, they grow, where they live, expanded as the floating vegetation of the sea; expanded and yet not always necessarily to the same degree; for the disposition of the parts of the pattern must be capable of change according to whether the polar points are unrestrictedly free to act on each other, or are engaged by foreign molecules or ions that come their way. A globulin is insoluble, does not expand, except when certain ions are available. The idea of attempting to collect the proteins from some millions of cells without change may be as unpractical as it would be to collect a handful of gossamer webs in order to study the way in which they were put together. It is impossible to dispute the evidence for structure in protoplasm, while at the same time it is impossible to deny it at all times fluidity. Structure in liquids must appear as one of those incomprehensibles of which the great physician exhorted us to have a glimpse, "things that thought doth but tenderly touch"; but it is not merely an idea, it is a reality that must be apprehended. Liquid crystals are formed not only by derivatives of cholesterol, but also by many substances of known chemical constitution, azoxyanisol, ethyl azoxybenzoate, esters of p.-azoxycinnamic acid, and many others; and the viscosity of some of the melted substances has been measured in the isotropic condition and found to change as the crystals form.

THE PERMEABILITY OF CELLS.

The question, then, is how far will such ideas of protein solutions as we can form serve to account for the properties of protoplasm. The aggregates of molecules that constitute the colloidal particles in protein solutions are, it is commonly agreed, like sponges, full of water. Most cells, but not all, are in most circumstances permeable to water: the cells that line the stomach are not, at least water is not absorbed there as it is beyond the pylorus, cutaneous epithelium cells let no water through, nor do the cells that line the bladder and ureter, neither when the osmotic pressure of the urine is one quarter nor when it is four times as great as that of the blood; and however it may be with keratinous squamous epithelium, the surface cells of transitional epithelium are clearly living nucleated cells composed of protoplasm. According to Hamburger[13] even some few red blood corpuscles are found intact after diluting blood with much water; and when treated with cobra venom this property becomes general. Lillie describes sea-urchin eggs impermeable to distilled water until traces of calcium are added. In general, however, it may be said that protoplasm, even its surface layers, are permeable to water; Heilbrunn[6] has shown that as a cell swells in hypotonic solution the viscosity of the protoplasm diminishes, as it shrinks in a hypertonic one the viscosity increases. Disregarding, therefore, for the moment exceptional cases, important though they may be, the general permeability of cells to water is what might be expected if they were composed merely of colloidal proteins. But in the known properties of common proteins there is little to warrant our ascribing to the proteins that protoplasm contains, and to them alone, all the phenomena of impermeability to other substances than water which it manifests, unless it be in the case of substances in colloidal solution. Fibrin clot and casein curd cannot even hold back the proteins of serum and whey. A jelly of gelatin, though unlike these it is impermeable to colloids, has since the days of Graham been known to allow rapid diffusion of salts, and when used in ultra-filtration lets, as far as is known, everything but colloids through. Gels are permeable to common salts: that does not mean, of course, that they offer no obstacle at all to their passage. The very viscosity of mere solutions of proteins shows that in such solutions the freedom of movement of even water molecules is impaired. The greater the concentration of the gelatin in a jelly the more this freedom is restricted. It is practically impossible to disentangle the last traces even of water from gelatin. The freedom of movement of molecules of salts must be still more restricted. It is known that the diffusion of salts in concentrated gelatin jellies is considerably impeded, and that of different salts in different degrees—e.g., sulphates more than chlorides. The salting out of proteins is most easily understood in this way. The water can get free from the meshes of the protein molecules more easily than the salts can diffuse in, the more so the more the expanded protein molecules contract as the water escapes. The enormous pressures necessary in ultra-filtration through gelatin filters also bear witness to the obstruction that protein molecules when closely packed offer to the movement of salts. But it is quite another matter to ascribe all the semi-permeability of the cell to such protein structures as the dimensions of cells allow. If a jelly permits the diffusion of salts we have no right to suppose that the molecular aggregates in the viscous colloidal solution of gelatin or other protein do not.

But there is no characteristic of cell protoplasm that is more fundamental, none more essential to the performance of its functions, than selective semipermeability capable of variation. When we understand how this is brought about, in all the degrees in which it can in different conditions be observed, there will be no mystery in secretion, nor in absorption, probably none in the activities of muscles and of nerve cells.

Nor can we escape by supposing this semipermeability to be the property only of a mysterious surface layer, while the rest of the cell behaves as if merely a colloidal protein solution. It is true that Chambers has in his fascinating work carried out the delicate operation of injecting solutions into starfish eggs through pipettes with a bore of less than 1μ, and seen that the salts ammonium chloride and sodium carbonate diffuse uniformly through the protoplasm stained with neutral red; whereas if the eggs are merely suspended in solutions of these salts the NH_4 or CO_3 ions pass in through the surface layer but not the Cl or Na ions. In this egg, therefore, this semipermeability is the function of the surface film. But the physiology of cells is not all of it exemplified in a resting egg cell. The cell that secretes, the cell

that absorbs, must have protoplasm that is discontinuous. In it there must be delimited regions bounded by surfaces, here at one moment, somewhere else the next, impermeable where but now they were permeable. It is not possible to reconcile physiological functions with a conception that admits semipermeability only at the superficies of the cell.

Semipermeability is the corner-stone in the structure of protoplasm. It is hard to see how anything that is known of the properties of proteins can enable them to provide for this. Loosely put together of heterogeneous atomic groupings, loaded up with water as they are, nothing but faith in the miraculous virtues of the unknown can have made us ascribe to them alone all that is puzzling in the edifice of the cell. If what is known is to count for anything, is it not at least possible that the paraffin chains of fatty acids and their derivatives may help us out? Some sort of partitions there must be; films that spread across the interstices of the labile spongy protein framework. Even were the protein coagulated, shrunken and set, this seems to be no less necessary.

INTERFACIAL PHENOMENA AND CELLULAR PHYSIOLOGY.

In attempts to fashion cytological conceptions on lines that are familiar in physical chemistry much has been made of the significance of surfaces in cells, not only the surface presented by the cell to its environment but also the surface of the protein aggregates in the colloidal solution constituting its substance. As the cell membrane has been supposed to be formed by adsorption at an imaginary interface between water inside and water outside the cell, so, too, an imaginary interface between the water permeating the "emulsoid" aggregates and that in which they float has been supposed equally to be the seat of adsorption. The aggregates are supposed to be mainly protein with relatively little water in their composition, the surrounding liquid water with relatively little protein in it, and that little in true solution. In an emulsion there is a true interface between immiscible liquids. Is it not possible that the pernicious suggestiveness of a term has deceived us? Can there be interfaces in the true sense of the word in an "emulsoid," where there is no question of immiscible liquids; where the liquid is the same throughout, and the non-aqueous phase, a solid, but solid something as an expanded seaweed floating in the sea is solid. Where is the interface? The many chemically polar points in protein molecules, by reason of which these molecules tend to adhere to one another, may serve, no doubt, to hold molecules or ions of other kinds as well; but if so the forces that determine the fixed positions of these foreign molecules and ions are not those understood to operate in adsorption. It is not a simple case of the Gibbs Thompson law. Fats are truly immiscible with water. Where oil begins water ends and there is a true interface. A monomolecular film of fat or lecithine coheres by virtue of the affinities of paraffin chains for each other, with which water has nothing to do. These chains are known to cohere. Straight, smooth, and homogeneous, they may be expected to fit closely and present, at least so far as they are saturated chains, no points to which foreign molecules or ions can attach themselves so as to weaken that cohesion.

If in order to understand the physiology of cells it is necessary to take into account interfacial phenomena, it is fats rather than proteins that we must look to to provide the interfaces. Surface phenomena, surface tension, and the formation of surface membranes presuppose a boundary at which the liquid water ceases: the presence of protein molecules, floated out in the water and containing many times their weight of water, sets no such boundary, even though the freedom of movement of water among the floating fabric of these molecules is somewhat restricted. When it is said that protoplasm is immiscible with water, the only way in which the proteins that it contains can account for this property in it is if the spreading protein molecules tend to join up, so as not to be scattered by the kinetic activity of the water within and without the region through which they are spread out. It is true that other colloidal ions to which the protein molecular meshwork is impermeable may give rise to unequal distribution of electric charges, because of the permeability of the same meshwork to smaller ions with a charge of opposite sign. But no one has yet succeeded in making it clear how any fundamental physiological functions in cells can be elucidated by this fact.

Whichever way we turn, therefore, we find that what is known of proteins points to the impossibility of accounting for the properties of the cell substance by their aid alone. Whichever way we turn there are indications that what is known and what it is possible to learn of the properties of fat must be of service. The rôle of fats in vital phenomena is a subject on which it may be expected that much may turn that is of importance to physiologists and to physicians.

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CARBOHYDRATE TOLERANCE IN PREGNANCY.*

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As early as the middle of last century Blot[1] called attention to the relatively frequent occurrence of glycosuria in pregnancy, but not until about the beginning of the present one was its influence on carbohydrate metabolism accurately studied, when v. Jaksch,[2] Hofbauer,[3 4] Lanz[5] and others showed that glycosuria could often be produced in pregnant women who were not spontaneously excreting sugar by increasing the amount of carbohydrate taken.

Pathogenesis of Experimental Glycosuria of Pregnancy.

The pathogenesis of this pregnancy glycosuria was assumed to be the same as that of diabetes mellitus. Thus Cristalli[6] asserted that it was due to a functional weakening of the liver by pregnancy, a view which was adopted by Hofbauer[3 4] in Germany.

The introduction of practical clinical blood-sugar estimation methods in the beginning of the present century rendered possible a more accurate study of the relation between the sugar in the blood and urine, and it was found that while diabetic glycosuria was always due to hyperglycæmia, excretion of sugar in pregnancy could often be demonstrated in association with normal or slightly augmented blood-sugar (Novak, Porges and Strisower,[7] and Jacobsen [8]). Glycosuria occurring spontaneously in pregnancy was, in the light of these investigations, classed with "renal diabetes" which Klemperer[9] had already described in the 'nineties. The numerous investigations of later years seem to show that the experimental

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glycosuria of pregnancy is also caused by increased permeability of the kidneys, the so-called renal threshold, but all do not at present share the same opinion, for Dietrich,[10] for example, recently maintained that it was the result of an abnormally high blood-sugar rise—a "morbid depression of the power of assimilation."

Frequency of Experimental Glycosuria of Pregnancy.

Just as opinion is divided with respect to the pathogenesis of the experimental glycosuria of pregnancy, so also do views differ as to its frequency. A few authors like Frank and Nothmann,[11] Wetz and van Netz,[12] and Bauer,[13] state that glycosuria following an excess of carbohydrate can be constantly produced in the first three months of pregnancy, and therefore recommend a tolerance test as a certain diagnostic sign of pregnancy. Others, on the contrary, such as Seitz and Jess,[14] only detected glycosuria in half the cases examined, and deny the value of the test from a diagnostic point of view.

Concerning the actual cause of the glycosuria of pregnancy there are only the investigations of Küstner,[15] who concludes from them that the sugar excretion is of renal origin, and due to a function of the corpus luteum. In women, carbohydrate tolerance—measured by the blood-sugar rise following the administration test—and the position of the renal threshold have been studied very little, most of those who have undertaken these investigations having worked with men. However, we should expect, a priori, that, just as in men, individuals can be found with a low renal threshold and a relatively high blood-sugar rise after administration of carbohydrate with consequent glycosuria. Before judging the effect of pregnancy therefore, we must first clear up the questions of the tolerance and threshold in non-gravid women.

Experimental Results.

The work to be recorded here was carried out during 1923 in the Gynæcological Clinic. For permission to do it, as well as for kindness and help during the work, I am much indebted to Prof. Brandt. The object of the experiments was to discover how often glycosuria can be produced in pregnancy, whether the glycosuria is a result of a low renal threshold or is due to a big blood-sugar rise, and lastly whether any cause for the low threshold or the marked hyperglycæmia which provokes the sugar excretion can be found.

All the persons investigated received 50 g. chemically pure glucose dissolved in 200 c.cm. water in the morning on a fasting stomach. Blood-sugar analyses were made beforehand and every 15 minutes for two hours after the administration of the sugar solution, while the urine was examined every half hour. The blood-sugar determinations were done by Hagedorn and Norman Jensen's method,[16] and the urine was tested for sugar by means of Benedict's reaction. In a number of cases the calcium content of the blood serum was estimated by Kramer and Tisdale's[17] method.

As will be seen from Table I., 19 non-gravid women were investigated. These women were not absolutely

TABLE I.

Nineteen Non-gravid Women.

Glycosuria in 5—	Max. hyperglycæmia :—	
	Less than 150 in none.	
	Between 150 and 200 in 2.	
	More than 200 in 3.	
No glycosuria in 14—	Less than 150 in 4.	
	Between 150 and 200 in 8.	
	More than 200 in 2.	

normal, but had more or less trifling complaints such as dysmenorrhœa, displacements of the uterus, &c., which could hardly be accused of affecting the carbohydrate metabolism. Five of the 19 non-pregnant women got glycosuria. In two the glycosuria occurred with a maximal blood-sugar rise of between 150 and 200 mg. per 100 c.cm. blood, while in the other three the glycæmia was above 200 mg. None excreted sugar with a blood-sugar rise of less than 150 mg.; in other words, there were none amongst the 19 with a low renal threshold. In two of the women who did not excrete any sugar the blood-sugar rose above 200 mg. These two thus had higher renal thresholds than we generally find. As will be seen, no less than five of the 19 had hyperglycæmia in excess of 200, which seems to show that relatively high blood-sugar rises are rather common in women.

Altogether 39 pregnant women were examined in whom glycosuria had not been previously demonstrated. Thirteen of them were in the first three months of pregnancy, and the remaining 26 were in the fourth to ninth months. (Table II.) Eight of the

TABLE II.

Thirteen Women, Pregnant in the First Three Months.

Glycosuria in 8—	Max. hyperglycæmia :—	
	Less than 150 in none.	
	Between 150 and 200 in 1.	
	More than 200 in 7.	
No glycosuria in 5—	Less than 150 in 1.	
	Between 150 and 200 in 4.	
	More than 200 in none.	

Twenty-six Women, Pregnant in the Last Six Months.

Glycosuria in 10—	Max. hyperglycæmia :—	
	Less than 150 in 5.	
	Between 150 and 200 in 5.	
	More than 200 in none.	
No glycosuria in 16—	Less than 150 in 9.	
	Between 150 and 200 in 7.	
	More than 200 in none.	

13 got glycosuria while five were free, and of the 26 whose pregnancy was more than three months advanced, ten had glycosuria, but there was no excretion of sugar in 16. The number of persons investigated is too small to form the basis of accurate statistics, but the experiments indicate that glycosuria can be provoked in about 50 per cent. of all pregnant women, and therefore rather more often in pregnant than in non-pregnant women, and that it can be produced more frequently early in pregnancy than in the later months.

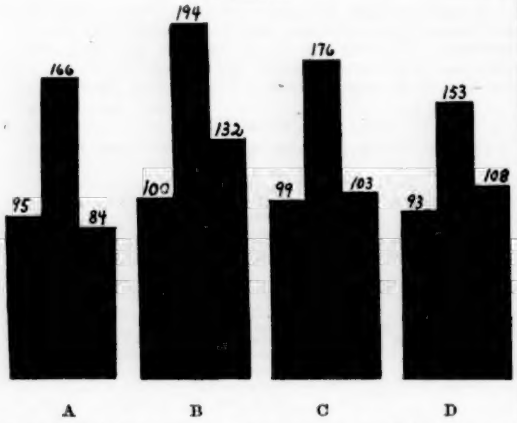
On inquiring into the relation of glycosuria to glycæmia it will be seen that in the first three months no fewer than seven of the eight women who got glycosuria had blood-sugar rises above 200 mg., while one had hyperglycæmia between 150 and 200. In the women who were past the third month of pregnancy the conditions were different, since five who got glycosuria had blood-sugar rises less than 150 mg. and the other five between 150 and 200 mg., while none had more than 200 mg. Glycosuria therefore has usually a different pathogenesis in the first and second periods of pregnancy. In the first months there is a sharp blood-sugar rise which causes glycosuria, while the position of the threshold does not deviate from the normal, so that there is no renal glycosuria. In the latter part of pregnancy, however, glycosuria is, as a rule, due to a low renal threshold, while the blood-sugar rise is often remarkably small, and thus glycosuria in this stage of pregnancy can rightly be classed as renal.

As will be seen, in addition to the characteristic difference in the situation of the renal threshold there appears also to be a distinction in the blood-sugar rise—that is to say, in the carbohydrate tolerance in the first months and later in pregnancy, and a further investigation of tolerance is therefore of interest. The best measure of carbohydrate tolerance is a determination of the area of the blood-sugar curve after a large dose of glucose, as proposed by Hagedorn.[18] This calculation, however, is laborious, and in my opinion almost as good an indication of tolerance can be obtained merely from the maximal blood-sugar rise and the blood-sugar concentration two hours after the sugar solution is taken. By calculating the mean value of these concentrations and of the glycæmia before the experiment in non-

pregnant cases in the first three months and in the last six months of pregnancy, the values can be graphically expressed as in Fig. 1.

In 19 non-pregnant women the *mean* blood-sugar concentration before the experiment was 99 mg., the maximal concentration 176, and after two hours 103 mg. In 15 women in the first three months of pregnancy the same values were 100, 194, and 132 respectively, and in 28 women in the last six months

FIG. 1.



Carbohydrate tolerance in various classes. A, 25 healthy men; B, 15 women pregnant one to three months; C, 19 non-pregnant women; D, 28 women pregnant four to nine months.

the figures were 93, 153, and 108. For the sake of comparison the result of the same tolerance test in 25 healthy men is recorded, whom I had previously investigated and whose values agree rather well with those of the non-pregnant women. It will be observed that the average blood-sugar rise in the first three months of pregnancy is considerably higher and lasts longer than in the non-pregnant, while at a later stage of pregnancy it is less than in the non-pregnant and much less than in women in the first three months of pregnancy. The number examined was so large that the result cannot be due to chance but must indicate a causal relation, which proves that in the first months of pregnancy there is, as a rule, a more or less pronounced hypofunction of carbohydrate metabolism, while in the latter part the opposite is often the case—that is to say, there is a marked capacity for rapidly metabolising large quantities of carbohydrate. If the several blood-sugar curves are studied, which space does not allow, the difference referred to will be still more striking, for it will be observed that some of the women in the early stages of pregnancy have blood-sugar curves which are typical of diabetes, while many in the later months only get a very small blood-sugar rise.

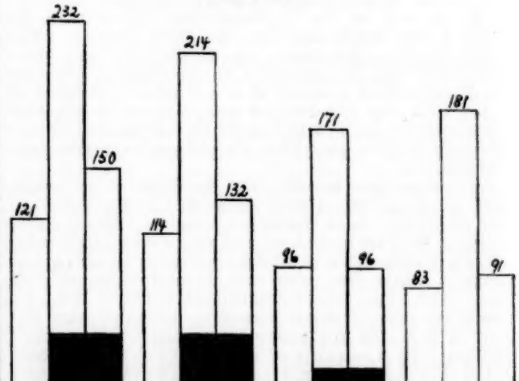
The tolerance test was done in a patient of 42, who suffered from repeated abortions, before and after two operations. The first two tests were made when the patient was two and a half months pregnant. As will be seen from Fig. 2 large blood-sugar rises occurred on May 18th and 21st, greatest in the first test, and also marked glycosuria, indicated by the black square at the foot of the columns. A few days later sterilisation by laparotomy was performed, and at the same time a corpus luteum of the right ovary was extirpated. The next tolerance test was done 12 days after the operation. There was a considerably smaller and shorter blood-sugar rise and slight but undoubted glycosuria. On June 2nd the uterus was evacuated, and on June 13th the fourth test was carried out. This showed a higher blood-sugar rise than the third test, but in spite of this there was no glycosuria. We can hardly conclude anything from these experiments on a single patient, because hyperglycæmia can vary greatly in uniform experiments in the same person, and, moreover, its maximum can only be approximately determined when blood samples are not taken more often than every 15 minutes. But if the experiments on this patient are taken in conjunction with those previously referred to, which show that the blood-sugar concentration after a tolerance test usually rises considerably higher in the first three months than later on in pregnancy when the corpus luteum is undergoing involution; and when it is remembered that the renal glycosuria often found in the later months of pregnancy disappears immediately after delivery, the experiments on this patient indicate that the corpus luteum of pregnancy depresses the carbohydrate tolerance measured by the height and duration of the blood-sugar rise and that the fœtus or placenta causes the low renal threshold which is characteristic of the later months of pregnancy.

In 12 non-pregnant cases 17 tolerance tests were done before, during, and after menstruation, to decide the question whether the corpus luteum of menstruation affects tolerance and the threshold as Küstner believes he has shown. The blood-sugar rise, however, showed no characteristic relation to the menstrual period, and the position of the renal threshold seemed to be identical, before, during, and after menstruation. Nor did the calcium concentration of the blood serum, which varied between 7·8 and 9·8 mg. per 100 c.cm. in ten pregnant and one non-pregnant woman, seem to exert any influence on the hyperglycæmia or the situation of the threshold after an administration test.

Summary.

To recapitulate the results of the present experiments, it appears that the investigation of glycosuria after large doses of glucose, as recommended by many

FIG. 2.



Carbohydrate tolerance in a patient of 42. A, before operation, May 18th; B, before operation, May 21st; C, corpus luteum extirpated, June 2nd; D, uterus evacuated, June 13th.

authors, is not valid as a diagnostic aid in pregnancy, because glycosuria occurs relatively frequently in non-pregnant women, while it is far from being constant in pregnant ones. Second, the experiments prove that there is a curious and characteristic difference in the blood-sugar rise and position of the renal threshold in the first and second periods of pregnancy. Early in pregnancy the position of the threshold is normal and the blood-sugar rise is often remarkably high, so that the glycosuria is due to

the marked hyperglycæmia and is not, as is generally believed, of renal origin. In the latter part of pregnancy, on the other hand, the blood-sugar rise is usually small but the renal threshold nevertheless, is often so low that glycosuria frequently occurs, which therefore, in this stage of pregnancy, can rightly be termed renal. Finally, the work has made it probable that the corpus luteum causes the large and prolonged blood-sugar rise which is characteristic of early pregnancy, while the low renal threshold in the later months appears to be dependent on the fœtus or placenta.

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RICKETS AND CHOLESTEROL.

BY O. ROSENHEIM

AND

T. A. WEBSTER.

(*From the National Institute for Medical Research, Hampstead.*)

WITHOUT discussing the already extensive literature of the subject[1] it may be said that the pre-eminent importance of sunlight and ultra-violet rays in the prevention and cure of rickets is now generally recognised, and further that it has not hitherto found a satisfactory explanation. In connexion with the anti-rachitic effect of radiant energy, it occurred to one of us (O. R.) to associate it with an apparently unnoticed observation on the effect of light on cholesterol, made more than 20 years ago by Ritter (1901). His accidental observation that specimens of pure cholesterol, prepared 25 years previously by Schulze from gall-stones and lanolin, showed a drop in melting point of about 30° C. and had become yellow in colour, was afterwards confirmed by Schulze and Winterstein (1904, 1906) and shown to be due to the action of light. (See also Lewkowitsch, 1909.)

The possibility of an association of fat-soluble vitamin with cholesterol or a similar substance had also gained probability by the further study (unpublished) of certain colour reactions of cod-liver oil and liver fats of other animals, mentioned in a previous communication by Rosenheim and Drummond (1920). This assumption received further support by the discovery of Steenbock and Black (1924) that irradiation of food and inactive vegetable oils conferred growth-promoting and anti-rachitic properties on them. The activation of vegetable oils by ultra-violet light was confirmed by Hess and Weinstock (1924), and later these observers showed that the anti-rachitic properties of the irradiated oils were confined to the unsaponifiable fraction.

Action of Light on Sterols.

Guided by the consideration that the presence of sterols (cholesterol and phytosterol) is one factor common to the fatty secretions of the skin of man and animals as well as to vegetable oils, we were led to correlate the effect of light upon them with the production of an assumed anti-rachitic vitamin in both. In view of the observations of Schulze and Winterstein, those of ourselves, as well as those of the above-mentioned authors, we decided to investigate the action of light on cholesterol with regard to the photochemical production of a vitamin. The preliminary results of one part of these experiments, dealing with the growth-promoting vitamin A, have already been published by Drummond, Rosenheim, and Coward (1925),[2] and the present communication is concerned with the anti-rachitic vitamin D only. We are greatly indebted to Dr. Leonard Hill, F.R.S., for the use of the experimental animals which were fed under his control.

We soon established the fact that the action of ultra-violet light on sterols produces effects similar to those of ordinary light as observed by Schulze and Winterstein, but incomparably more intense. Thus, for instance, the melting point of pure cholesterol (from brain) fell from 148·5° to 125° C. after five hours' radiation from a mercury-vapour quartz lamp at a distance of 10 cm. Sitosterol (from wheat) similarly exposed showed a fall from 136° to 120° C. The melting point of coprosterol (from dogs' fæces) fell from 97° to 56° C. The latter well-crystallised substance was converted by the action of ultra-violet light into an amorphous yellow resin, whilst cholesterol and sitosterol, previously pure white, had become yellow. These effects are undoubtedly partly due to oxygen and to the ozone which is generated by the quartz lamp. In order to exclude this factor, which might possibly exert a deleterious action on any active principle formed, we decided to irradiate cholesterol in an atmosphere of nitrogen as well as in air. In view of the low penetrating power of ultra-violet rays and their subsequent absorption by the surface layer of cholesterol crystals, we used a solution of the latter in liquid paraffin. This solvent was chosen as it allows the passage of ultra-violet light and has no anti-rachitic properties by itself nor after irradiation. Preliminary experiments establishing this point also proved that, in the doses given, it had no purgative or other effect on rats. We had previously found that a watery suspension of cholesterol soon deposited a yellowish resinous substance on the sides of the quartz flask on radiation, thus preventing uniform action and an accurate dosage. A colloidal solution of cholesterol in water was also tried; it does not flocculate on radiation, but has the disadvantage of a low strength (0·25 per cent.).

Cholesterol easily dissolves in warm liquid paraffin, and a 2·5 per cent. solution was used. Whereas it crystallises out of this solution at room temperature, it was found that after radiation in a rotating quartz flask (in air or in nitrogen) it remained more or less in solution, thus indicating a physical or chemical change. At the same time the solution differs from the non-irradiated one by reacting with certain substances, yielding colour reactions which are still under investigation.

Experimental Results.

Our tests were carried out on rats, the technique usually employed in this laboratory being followed, the Sherman-Pappenheimer, 84, low phosphorus diet being used. Six rats were used for each series and the control. Diagnosis was made from radiographs of the animals killed at the end of the experimental period. We also determined the inorganic phosphate content of the mixed blood of each group.

Several series of experiments were made with cholesterol radiated in an atmosphere of nitrogen and also in air for periods of half an hour, five hours, and

[1] For a review of the literature up to 1924 see Special Report Series No. 38, Medical Research Council, second edition, 1924.

[2] It has since been found by these authors (private communication) that the growth-promoting effect of irradiated cholesterol, previously reported, is not a lasting one. The action of irradiated cholesterol on growth is therefore apparently identical with that of ultra-violet light itself and would seem to consist, like the latter, in mobilising the animal's reserves of vitamin A or, as suggested by Steenbock and Nelson (1923), by compensating the insufficiency of the anti-rachitic principle.

ten hours respectively. All the exposures to ultra-violet light were made in a rotating quartz flask. The doses varied from 0·2 mg. to 4 mg. of irradiated cholesterol and were administered per os daily to each individual rat by means of graduated capillary pipettes. The results are given in the table.

Results of Radiation Experiments.

Duration of radiation.	Dose administered.			Blood inorg. phosp. mg. %.
	0·2 mg.	2 mg.	4 mg.	
In nitrogen—				
½ hr.	Mild rk.	No rk.	Died.*	2·9
	„	„	No rk.	
5 hrs.	„	„	„	4·2
	„	„	„	
10 hrs.	V. mild rk.	„	„	4·1
	No rk.	„	„	
In air—				
½ hr.	Mild rk.	No rk.	No rk.	3·4
	No rk.	„	„	
5 hrs.†	—	—	—	—
10 hrs.	Mild rk.	No rk.	No rk.	4·1
	No rk.	„	„	
Controls	Mild rk.	Mild rk.	Marked rk.	3·0
	„	Mod. rk.	Mild rk.	

V. mild rk. = Very mild rickets. Blood inorg. phosp. = Blood inorganic phosphate.
* This rat died of broncho-pneumonia.
† This experiment had to be discarded, one rat having been partly consumed by its fellows.

Conclusion.

From these results it may be concluded: (1) That irradiation of cholesterol with ultra-violet light confers on it definite anti-rachitic properties, both in the presence and absence of oxygen. (2) Under the particular conditions of our experiments, increasing the time of radiation seems to increase somewhat the amount of anti-rachitic substance. (3) Taking the content of inorganic phosphorus in the blood as an index, it would appear that the limit of protection against rickets is reached by a dose of 0·2 mg., and this is especially marked in the half-hour radiation experiments.

During the progress of this work a communication appeared by Hess, Weinstock and Helman (1925), in which these authors reported results agreeing with ours in their main conclusion. They found that irradiation of a watery suspension of cholesterol or phytosterol conferred anti-rachitic properties on these substances. It may be remarked that in these experiments the lowest protective dose was five times as high as our lowest dose, and that their figures for the inorganic blood phosphates as a whole are on a lower level. These differences may find an easy explanation by the variation of procedure and the medium employed, and it is satisfactory to note that two groups of observers were led to the same result independently and guided by different considerations.[2]

Whilst it would be premature before further work has been carried out to assume the identity of the anti-rachitic vitamin with the active constituent of irradiated cholesterol, nevertheless the fact that anti-rachitic properties can be experimentally conveyed to such a well-defined chemical substance as crystallised cholesterol correlates the proved photosynthesis of this vitamin by the plant with its presumed photosynthesis in the skin, and thus affords a rational explanation for the beneficial effect of light in the cure and prevention of rickets. The presence of cholesterol and its derivatives in the skin and its fatty secretions, together with the easy absorption by the skin, of such fats rich in cholesterol as lanolin, would appear to strengthen the assumption that a vitamin formed from cholesterol in the skin under the influence of light would be easily absorbed and then liberated into the blood-stream.

[2] While this note was in the printers' hands, a communication appeared by Steenbock and Daniels (J. Amer. Med. Assoc., 1925, lxxxiv, 1093) in which they mention, without giving details, that irradiated sterols possess anti-rachitic properties.

These investigations are being continued, especially in the direction of elucidating the chemical changes which take place in cholesterol under the influence of light.

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TREATMENT OF LUPUS BY IONISATION.

BY JAMES B. WHITFIELD, M.B.,
CH.B. GLASG.

HAVING had some gratifying results in treating lupus by ionisation, it was thought that an account of an extensive affection in a young man aged 18½, successfully treated by this method, might be of interest, and so an accurate record of the treatment given and progress made was kept.

The patient was sent to me in 1921. He had been suffering from lupus on the buttocks since he was two years old, a period of 16½ years. In making the diagnosis of lupus care was taken to exclude other skin affections, especially specific disease, of which no trace could be found, either historical or clinical. When treatment was commenced the disease was in active progress as is shown in Fig. 1, a photograph taken on Oct. 23rd, 1921. The thick advancing edge can be seen extending down the thighs. Fortunately the anus was not involved.

FIG. 1.

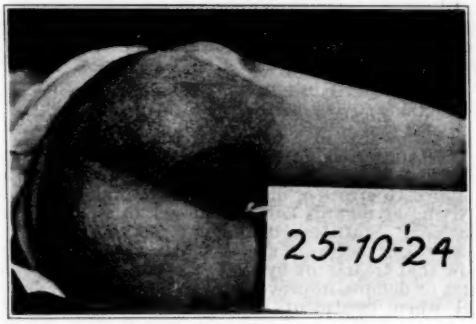
Before treatment by ionisation.

Technique.

The affected area was thoroughly cleansed with warm water and soap, dried, and sponged over with a 5 per cent. solution of potassium hydrate, which was left on for three minutes and then washed off with warm water, the object being to remove the resistant layer of skin which covers the tubercles. The patient then sat in a papier-mâché bowl on eight thicknesses of "Turkish towel," under which was an electrode eight inches square. A 2 per cent. solution of zinc sulphate was put into the bowl in such quantity that the affected area was covered. The scrotum, which was not affected, was protected by being anointed with soft paraffin. The positive lead of the electric current was connected to the electrode in this bowl. The negative pole was in a similar bowl containing a 1 per cent. solution of common salt, into which the patient put his feet. A current of electricity was then turned on, beginning at zero, and slowly increased until it reached 40–50 milliampères, and was continued for about 90 minutes.

At first the treatment was repeated at intervals of 14 days. Improvement in the condition was soon manifest; the advancing edge cleared up in about three months, but the old tubercles, which had become, as it were, encysted, were much more resistant. It was due to these old lesions that the treatment had to be carried on so long; until the resistant covering is removed the passage of the ions is almost impossible and the treatment is of little avail. After treatment has been given there is a considerable reaction, which begins in two or three days and continues for three or four days. It gives very little trouble to the patient and always clears up. No dressing is required other than a clean cloth placed in the under-garment while the reaction is in progress.

FIG. 2.



After treatment.

During the three years treatment was given on 54 occasions as follows:—

First year	21,	averaging	44	milliamps. for	84 minutes.
Second	„ 18,	„	32	„ „	77 „
Third	„ 15,	„	27	„ „	61 „

At the end of the second year the disease had practically disappeared, but the treatment was carried on as a safeguard against relapse. The final result is shown by the photograph (Fig. 2) taken on Oct. 25th, 1924. There is an extensive scar, as may be expected, but it is quite soft and shows no sign of contraction or thickening.

This case is one of many that have been treated by ionisation with similar results. It is chosen as an illustration because of its long standing and the extensive area covered. It had not been treated in any way other than by the application of ointments and lotions at various times.

Ilkley.

Medical Societies.

INTERNATIONAL ASSOCIATION OF THALASSOTHERAPY: CONGRESS AT ARCACHON.

Dr. L. LALESQUE presided over the Fourth International Congress held on April 27th to 29th at Arcachon (Gironde), under the patronage of the President of the French Republic, when the treatment of rickets was the centre of discussion. Representatives of governments and learned societies attended a solemn opening session at 10 A.M. on April 27th. In the evening there were receptions and gala performances and a banquet. On April 30th visits were paid to neighbouring medical institutions, notably Fondation Wallerstein (Arès) and Moutchic (Lacanau-Lac), each known as a "preventorium." At these institutions children of tuberculous parents, deceased, are cared for, educated, and eventually placed out in the world in some occupation for which they are fitted. The children live almost entirely in the open air and the occurrence of tubercle among them is practically unknown. On May 1st the Congress went to Biarritz and in the evening members were entertained by the municipality at a banquet.

Representation.

The countries represented were England, France, Italy, Spain, Holland, Belgium, Roumania, Sweden, Poland, Czecho-Slovakia, Esthonia, Cuba, Algeria, Uruguay, and Monaco.

The following congressists were accredited delegates from different scientific bodies or ministries of health: England: Dr. W. Gordon (Royal College of Physicians of London), Dr. Howard Humphris (British Medical Association), Dr. G. L. Pardington (Royal Society of Medicine). France: Dr. Armand Delille, Dr. Chauveau (General Secretary of the Congress), Dr. Delcroix, Prof. Desgréz, Dr. Gimbert, Dr. Jaubert, Dr. Mercier des Rochettes, Dr. Monod, Dr. Pierret (General Secretary for the English Section), Dr. J. L. Pech, Dr. Sorrel, Dr. Schmitt. Italy: Dr. Bardisian, Dr. Ceresoles, Dr. Maragliano. Spain: Dr. Pinilla. Holland: Dr. Hartog. Belgium: Dr. André, Dr. Delchef, Dr. Watry. Roumania: Dr. Anastasiu. Sweden: Dr. Halle. Poland: Dr. Knug. Czecho-Slovakia: Dr. Vesely. Esthonia: Dr. Blumenthal. Cuba: Dr. Amoedo. Algeria: Dr. Piquet. Uruguay: Dr. Acevedo. Monaco: Dr. Vivant.

The following journals were represented: "L'Avenir d'Arcachon," "La Dépêche de Toulouse," "La France," "La Gazette des Sciences Médicales," "Le Journal de Physiologie et Pathologie Générale," "Le Journal de Médecine de Bordeaux," "La Presse Thermale et Climatique," "La Presse Médicale," "La Petite Gironde," "La Vigie," and "The Lancet."

THE MARINE TREATMENT OF RICKETS.

Dr. JEAN ANDRÉ opened the discussion by reading a paper on the Marine Treatment of Rickets. This treatment, he said, rapidly causes to disappear the enlarged tonsils, the anæmia, the loss of muscle and nerve tone associated with rickets. The pale, flabby, and deformed infant after a few months of the treatment is transformed into a robust, bronzed child. The treatment raises the whole resistance of the body and is an excellent prophylactic against tuberculosis. While the rachitic child may be treated in the town with massage and appropriate regimen and applications of ultra-violet rays, &c., the cure will be neither so quick nor so complete as if it had been carried out by the coast. The northern coast of France is exceptionally advantageous to the rachitic by reason of the wind, the continual movement of the air, and the actinic rays, and protection from them if they be too strong is always easy. Hazon says the ozone in the air has a soothing effect, as does also the wide expanse of horizon and freedom from crowds. After a few months' sojourn by the sea the treatment should be stopped for a few weeks. When a return is made susceptibility is increased and in this way the good effects of the treatment are augmented. As large an area as possible of the skin should be exposed so that a maximum of radiation may be absorbed. In spite of crooked limbs the little patients should be allowed to walk about the sand, thereby increasing both muscular and nerve tone. In most cases the use of plaster is to be deprecated, though in genu valgum it may be used with advantage.

Dr. ARMAND DELILLE followed with a paper on

Rickets, its Pathogenesis by Deficiency of Sunlight and Helio-Marine Treatment.

Heliotherapy and sea-bathing, he said, are treatments which only commenced to be used in the latter half of the nineteenth century. The first results followed

the establishment of the hospital at Berck sur Mer and shortly after this several other similar institutions were erected. The treatment consisted in allowing the children to play on the beach followed by supervised bathes in the sea. It was later discovered that the absence of vitamins was only a contributory cause of rickets, and that the faulty assimilation of calcium and phosphorus was due to absence or deficiency of sunlight. Dr. Alfred Hess, of New York, making observations on 2000 cases of all classes discovered that cases of rickets occurred when sunlight was deficient, whatever the diet, that Negroes were more affected than whites, and that of the whites there were more cases among southern races. Also the incidence was greater in the spring than in the autumn, all facts pointing to the absence of light as the essential cause. Rachitic children treated with heliotherapy for other diseases, such as tuberculosis, improved in a remarkable manner, and the amount of phosphorus and calcium in the blood was considerably increased. Normally the calcium-phosphorus content of the blood is highest in July and August. Helio-marine treatment should be started as early as possible, for when the first stigmata, such as bony changes, are observed, the disease has already been present for some time. There is nothing to take the place of real sunshine, and the use of a quartz-lamp should be regarded as only a temporary makeshift. In the summer months the best situations are on the northern French coasts; the Mediterranean Littoral should be chosen during the winter. The method of treatment is to expose the lower extremities three times in the space of an hour for three minutes on the first day, the following day the time is increased to five minutes, while the forearms are exposed for three minutes. The area is extended in this way till the whole body is exposed. Treatment must be continued until the rachitic stigmata disappear or are arrested. The cure should always be undertaken under medical supervision, and the value of sea-bathing, massage, and good food must not be forgotten.

DR. EDOUARD DELCROIX dealt further with the

Marine Treatment of Rickets.

The marine climate, he said, is really specific in the treatment of rickets. A course carried out with method and of sufficient duration (at least a year to a year and a half in rickets of early infancy and six months in cases of adolescent rickets) will produce a cure. When children are treated by the sea sufficiently early, most of the bony deformities disappear without recourse to surgery. It is a great pity that seaside towns make so little provision for sea-baths. It is an absolute essential for the cure in winter and at all times for fat, pasty children, and for those in whom development is delayed. The mode of action of the treatment is complex. The changes are of a physical nature, chemical and even electrical, and it is their combination which produce the remarkable effects of climatic treatment. A sojourn by the sea unites all the conditions favourable to the cure of rickets.

DR. LEONARD HILL and MR. A. WEBSTER presented a

Report on Rickets,

which was read by DR. W. GORDON. Rickets, states the report, is a disease of civilisation. The incidence reaches its height in winter and declines in summer. Mellanby was responsible for the modern theory that the disease was due to deficiency in vitamin A. It has later been shown that the disease could be produced by withholding inorganic calcium and phosphorus. In 1919 Huldschinsky reported cures of rickets with the quartz-mercury vapour lamp. Experimentally he showed that the effective rays were of a wave-length of 300 Å or shorter. In rickets the blood is low in inorganic phosphorus and calcium. Cod-liver oil and ultra-violet light both increase the concentration of these substances in the blood and this takes place by means of increased absorption from the intestinal tract. For this reason it has been held that the primary seat of rickets is the gastro-intestinal tract. The rachitic animal has not lost the power of bone formation, but lacks the necessary materials. From the results of experiments these workers "feel justified in making the broad generalisation that provided that an animals is supplied with food just sufficient to maintain life and a little growth and is given the bare minimum of bone-forming elements, calcium and phosphorus, then if ultra-violet light be supplied in an adequate amount rickets will not develop however unfavourable the animal's environment be."

DR. HOWARD HUMPHRIS read the paper on

Light in the Prevention of Rickets,

which appeared in THE LANCET, May 2nd, p. 912.

DR. JAUBERT said: Rickets is most frequently found in towns and overcrowded quarters. It is due, not so much to errors of diet, as to unsuitable conditions of living as regards habitation, lack of air, light, and sunshine. Statistics, including a majority of severe cases taken between the second and fourth years, show that treatment by the sea produces 95 per cent. cures or definite improvement. The results are better still when treatment is started before deformities have appeared. In the marine cure, other complex agents also take part, air, sun, light, sea-water, and it is impossible to dissociate their actions and effects, but it must be admitted that the light of the sun takes a preponderant part in the cure of rickets.

DR. MERCIER DES ROCHETTES contributed an

Analysis of the Action of Marine Treatment on Rickets.

It has been proved, he said, that rickets can be arrested completely by such treatment. Children should be sent when quite young to the coast in order to obtain a rapid and complete cure, and special provision should be made for infants as young as 15 months. The stay by the sea must be prolonged till cure is obtained. The time varies with the age of the child, the gravity of the lesions, and the climate, and the best situation is where treatment can be practised all the year round. The treatment should consist of life in the open air, warm and cold baths, and heliotherapy. Under the age of 4 years deformities disappear generally completely, from 4 to 7 years considerable improvement can be expected; after the age of 8 years marine treatment has no effect on deformities. The keel-shaped chest can nearly always be completely cured, the deformities of the lower limbs can be improved, except the antero-posterior curve in the tibia which is resistant to thalassotherapy. Ultra-violet rays from the quartz mercury-vapour lamp cure rickets in children of 6 months to 2½ years. It improves the general condition and has some action on the calcification of bones. Natural heliotherapy by itself and far from the sea ameliorates rickets. Sodium chloride baths and artificial salt baths alone cure rickets at all ages. They not only improve the general condition, but diminish the deformity. Living in the open air by the sea is enough to improve considerably the general health and improve deformities up to the age of 7 years. Marine aerotherapy with heliotherapy combined is the best treatment as much for a preventive as for a curative agent.

DR. ROBERT PIERRET (Hon. Secretary to the British Section) spoke on the relation of

Thermal Cures at La Bourboule

to seaside treatment of rickets. In the same manner that surgeons endeavour to stop deformities in the legs Dr. Pierret corrects thoracic deformities in rachitic children. The method is to treat the nose and throat by hot arsenical and radio-active thermal baths. The local treatment both before and after removal of adenoids disinfects the respiratory tract and renders the air passages free from obstruction. The passage for the air being then sufficient the air pressure in the lungs is no lower than the atmospheric pressure, so that the ribs are in perfect dynamic equilibrium. The baths act on the general system at least as well as sea-bathing, but the thermal cure is enhanced

by a subsequent holiday by the sea. If the stay by the sea precedes the thermal treatment results are much less favourable. The waters at La Bourboule are highly arsenical, equivalent to 32 drops of Fowler's solution per litre. The favourable action of arsenic in the treatment of rickets is well known, and has recently been investigated by Prof. Hill at the National Medical Research Institute at Hampstead.

Dr. W. G. SUTCLIFFE outlined the advantages of the

Royal Sea-Bathing Hospital at Margate,

which was commenced as long ago as 1796. The building, he said, was considerably enlarged and modernised in 1882 and was still further enlarged in 1920. The present accommodation is for 265 patients, of which 100 are children whose education is carried on in the hospital. Hot and cold sea-water baths are provided in all the wards which are now arranged to open on either side on to covered verandahs so that patients can remain in the open air night and day. Sea-bathing is carried out by all patients that are fit for it during the summer months. Since 1904 the therapeutic agency of X rays has been freely utilised and the results obtained have been highly successful. Dr. Sutcliffe showed photographs of the wards and patients undergoing treatment.

Dr. J. L. PECH spoke on the

Biological Antagonism of the Infra-Red and the Ultra-Violet Radiations.

It has been known for a long time, he said, that the infra-red and ultra-violet rays are antagonistic and biologically opposed. It is generally forgotten that they nullify each other when acting simultaneously on a living subject. Experiments have led to the following conclusions, that it may be possible by an appropriate radiation to annihilate the effect of another radiation in action at the same time on a living subject; that two radiations can only be antagonistic to physio-chemical equilibrium in so complex a structure as the living organism, and their actions may vary with the particular organism. The effect of ultra-violet radiation on man is to produce an erythema and certain blood changes. If infra-red rays be exhibited simultaneously these effects are very much diminished or completely lost. The dosages in heliotherapy are imperfect and the infra-red rays are not taken into account, so that the results obtained are often diverse. Sunlight is withstood without marked skin changes by virtue of the infra-red rays, but when these are filtered, for example, by steam or moisture which occurs on heights and glaciers, dermatitis is very frequent, and for the same reason skin changes are more marked at the seaside than inland. The practical result of this is that it will be found in the future better results will be obtained in the cases of local treatment by using artificial sources of radiation so that only those rays required may be selected.

The next Congress will be held in three years' time, probably in Roumania.

ROYAL SOCIETY OF MEDICINE.

SECTIONS OF OPHTHALMOLOGY AND COMPARATIVE MEDICINE.

DISEASES OF THE EYES COMMON TO MAN AND ANIMALS.

THIS formed the subject of a joint discussion by these sections of the Society on May 8th, Sir ARNOLD LAWSON, President of the Section of Ophthalmology, being in the chair.

Mr. HUMPHREY NEAME opened with a paper on

Parenchymatous Keratitis in Animals.

He gave an exhibition of slides by the epidiascope and their description. The first illustrated a central rupture of the cornea of a sheep caused by a turnip striking it. Five days after the injury a very acute infection of the eye had occurred. Clouds of nuclei could be seen between the lamellæ, and the anterior chamber, between cornea and iris, was filled with purulent material. A layer of pus could be seen between the ciliary body, iris, and lens. Polymorphonuclear cells were abundant, and there was active suppuration. A ring abscess had occurred, the ring consisting of dense infiltration. Excision was not done in one case of keratitis, and the eye showed attempts at repair as extensive vascularisation had taken place. The polymorphs were replaced by round cells. In a less acute case, in a guinea-pig, the state of affairs was only evident on histological examination. Clinically the cornea was intensely opaque throughout, and during life there was an irregularity in its centre and its diameter was three or four times greater than normal. At the edge of the wound an attempt at repair could be seen, a downgrowth of epithelium filling up the edges of the wound. The pattern of the remainder of the cornea was largely lost, and there was marked cell infiltration. The next case demonstrated was one of tuberculosis in the eye of a cat. It was examined clinically before death, and the retina of one eye was detached. Both eyes were blind. In the eye most carefully examined there was a mass of tuberculous infiltration at the corneo-scleral junction, and multiple tuberculous nodules were seen in the iris and ciliary body. There was present a typical parenchymatous keratitis, and an intense lymphocytic infiltration, with a mass of cells on the back of the iris. This cat had tuberculous irido-cyclitis. Tuberculous parenchymatous keratitis occurred by extension of the disease from neighbouring structures. In this case the whole substantia propria was much infiltrated, also the fibres of the ligamentum pectinatum. At the corneo-scleral junction there was an almost staphylomatous condition.

Mr. Neame showed also sections from the eye of a rabbit which had tuberculosis from the subcutaneous inoculation of a tuberculous culture, mostly from lupus vulgaris of the human skin. Here a tuberculoma was evident at the corneo-scleral junction. In another tuberculous eye there was marked papillitis and extension of the tuberculous process into the optic nerve. A further case was one of distemper in a dog, and he showed a micro-photograph of a piece of the cornea. When seen clinically, the cornea was full of a network of vessels. There was intense infiltration, and a great overgrowth of connective-tissue cells. A section of an eye in an early case of distemper showed, clincally, nothing more than a slight haze of the cornea. Vascularisation was both deep and superficial. The cornea from a case of trypanosomiasis showed thin lines in the periphery and vessels extending a short way into the cornea. A mass of cell exudation extended into the anterior chamber, and the whole sclero-corneal junction and ciliary body were infiltrated. Trypanosomes were abundant in the specimens.

Mr. HENRY GRAY contributed a paper on

Ulcerative Affections of the Cornea,

their Complications and Sequelæ. He said this ulceration might occur in association with influenza in the horse, swine fever, trypanosomiasis, rabies, and as a result of infections of the conjunctiva. It was seen sometimes also when tuberculosis attacked the eye in oxen, sheep, cats, and dogs, in epizoötic lymphangitis, and in specific ophthalmia in the ox and the horse. In the dog this ulceration might be a sequel of paralysis of the ophthalmic division of the fifth nerve, or of tumours involving the roots of the nerve. In the horse and the cat, in which the cornea was thick, excavated ulcers were met with, but repair took place without much difficulty. Accompaniments of these ulcers were intense photophobia, lacrymation, and powerful blepharospasm. In the case of a wide ulcer, paracentesis should be carried out without delay, in order to avoid a large spontaneous perforation. When photophobia and

blepharospasm were present, cocaine drops should be instilled to relieve the conjunctival congestion.

Mr. A. F. MACCALLAN read a paper by himself and Mr. HERBERT MASON on

Cataract in Horses,

with some reference to iritis. The paper was based on the experiences of the writers in Egypt. Many varieties of cataract were to be seen in both man and the horse, including anterior polar, capsular, posterior capsular, cortical, lamellar secondary to irido-cyclitis, traumatic, and the dotted cataract of congenital origin. He said the mere presence of one or two opaque dots in a lens might not interfere with an animal for draft or riding purposes, but an extension of the opacity would make it useless for the saddle and for breeding, as most cataracts in horses were hereditary. Glasses could be provided for horses, but as the native Egyptian was satisfied with his lensless eye after the operation, glasses were deemed unnecessary for horses. He described the operation usually performed on the horse, and criticised the method of lens extraction set out in Woolridge's edition of Woodruff's work. In horses in France during the war there was a condition known as periodic ophthalmia, a form of irido-cyclitis. The animal had photophobia, with inflamed conjunctivæ, and the cornea was very hazy but not ulcerated. Also the iris was inflamed, and it was impossible to keep the pupil dilated with atropine. It was not a contagious disease, and could not be reproduced by injection of the eye humors into a healthy animal. It seemed to be due to some general disease, and post mortem there were found many opacities of the lens and flocculent opacities in the vitreous.

Discussion.

General Sir JOHN MOORE spoke in a general way of the eye diseases in army horses which occurred during the war in France. During that time there were 36,690 cases of eye disease in horses, and of these 19,813 were cured, while 2558 animals were destroyed, and 9723 cast and sold, the last-named being eagerly used as food. The most serious cases in these horses were those due to periodic ophthalmia, and at a conference with the French veterinary authorities careful consideration was given to this well-known disease, called in the old coaching days "moon-blindness." Horses which had this condition got very fat and were apparently healthy, but had to be relegated to work on the lines of communication. At one time during the war there were over 2000 horses being treated for periodic ophthalmia in France. Some veterinary officers believed the disease to be contagious, though the majority did not. Bacteriological examinations did not reveal any causal organism, and the disease was apparently as common in outside standings as in stables. Sir John Moore's own view was that bad sanitation was at the root of the disease, for during the war the animals were amidst great collections of fæces and urine.

Major DUNKIN said that in the keratitis seen in distemper in dogs the precedent condition was a conjunctivitis, accompanied by a profuse secretion of tears. It was only when the disease became chronic that a corneal opacity appeared.

Mr. M. B. OLIVER referred to an epidemic of periodic ophthalmia which he saw near Ypres in 1918. Contrary to what Sir John Moore said, many of these animals were obviously quite ill. He noticed they had iritis and cyclitis, with enormous exudates in the anterior chamber. In some the cornea was quite opaque. In all the cases he saw the horses were blind.

Mr. GRAY CLEGG spoke of the occurrence of hairy moles on the corneæ of dogs, and of cataract in older dogs.

Mr. T. HARRISON BUTLER described his experience in doing cataract extraction on a friend's King Charles spaniel. When he introduced the discission needle behind the iris and turned the lens down and removed the needle the lens sprang back, and this was repeated two or three times. Ether was then given and another attempt made, and as the anterior chamber became filled with blood he desisted.

Dr. RAYNER BATTEN referred to nystagmus in dogs, and double detachment of the retina in a cat. Very little provocation would produce interstitial keratitis in a dog's cornea. He had done an advancement operation for marked internal strabismus in a bulldog. Prominent eyes in dogs were very liable to become ulcerated, and if the ulcers perforated there was likely to ensue a secondary form of glaucoma.

Prof. WOOLRIDGE said that in his hands the treatment of glaucoma in the dog had been most unsatisfactory. Certainly extensive opacity occurred in that animal on slight provocation, but in most cases it cleared up. Dermoid growth in the eye of the dog could be easily dissected off. Though a considerable portion of conjunctiva carrying the hair might be excised, only a small permanent opacity remained. He did not think the stricture passed by Mr. MacCallan on Prof. Woodruff's description of the operation for cataract was justified.

Mr. TREACHER COLLINS spoke of the occurrence of parenchymatous keratitis in some pheasants at a shoot in Norfolk. These birds refused to rise, however nearly they were approached. One was sent to him for examination, and he found it had a vascular cornea and a typical interstitial keratitis. There was much cellular exudation and a marked development of vessels in the substance of the cornea. He asked whether veterinarians saw sympathetic ophthalmitis. He preferred for the disease which had been spoken of as periodic ophthalmia the term "periodic ophthalmitis." He had a specimen of dermoid growth in a pig's eye, which showed bristles sprouting out from the cornea, and in the Royal College of Surgeons Museum there was a specimen of a sheep's eye showing a tuft of wool.

Mr. TUDOR THOMAS spoke of a case of sympathetic cyclitis in a dog, both eyes being involved following injury to one.

Mr. GEORGE MACKAY (Edinburgh) referred to the readiness with which keratitis occurred in a dog which suffered a small perforation, and the facility with which it cleared up again. He described a case in which he removed the lens in a dog for cataract, and had a difficulty in getting it away, as it seemed to be, in comparison with the human, large, hard, and round. No sepsis ensued.

EXHIBITION OF CASES.

Snowball Opacities in Vitreous.

Dr. A. HUGH THOMPSON showed a man, aged 62, who had the vitreous of one eye filled with round white bodies, which moved with the globe in any direction. The fundus appeared normal, and the vision did not seem to be impaired. Vision was R. 6/12, L. 6/18. Some considered the condition was congenital, but this man had only noticed it of late years. The bodies were too large and dull for cholesterine crystals.

Tuberculous Keratitis in a Cat.

Mr. HAMILTON KIRK showed a case of this condition and directed attention to its frequent occurrence in this animal. This cat showed the disease in an early stage; it was brought to him six weeks ago, and there was only to be seen at present an amaurotic state of the pupil. He expected such lesions as detachment of retina to occur later. Tuberculosis affected the eye in cats, in addition to other organs, with remarkable frequency. There were nodular protuberances on the kidneys of the cat shown. 60 per cent. of dogs with distemper seemed to have eye trouble. In the human the nearest disease to distemper in dogs was measles, and eye troubles were not infrequent in measles. He thought the infection spread through the

nasal duct, through the stoppage of the channel for tears. In cats there was a catarrhal form of distemper, with chemosis, swollen conjunctiva, photophobia, pain, and the secretion of a thick, cream material, which glued the lids together.

Mr. NEAME referred to a paper dealing with eight cases of tuberculosis in cats, in all of which both eyes were affected. Coats found tuberculous masses in the choroid, with a variable degree of retinal detachment.

MANCHESTER MEDICAL SOCIETY.

A MEETING of this Society was held on May 6th, Prof. G. R. MURRAY, the President, being in the chair, when Mr. H. MORRISTON DAVIES read a paper entitled Observations on the Diagnosis and Treatment of

Intrathoracic Disease.

In the first part of the paper five cases of particular interest, either as regards diagnosis or treatment, were described: 1. Gumma of the lung simulating tuberculosis. 2. Primary bronchial carcinoma, discovered accidentally by the X rays in a patient suffering from chronic bronchitis and emphysema. The diagnosis was made originally on the radiogram, then made more certain by the appearance of characteristic symptoms, and finally confirmed by operation. 3. That of a woman who for 30 years had attended hospitals for dyspepsia, dyspnœa, and tachycardia. X ray examination revealed a diaphragmatic hernia. 4. Unilateral bronchiectasis, due, it was discovered as a result of treatment, to fragments of teeth which must have been in the lung for ten years. The bronchiectasis was treated by artificial pneumothorax and phrenicotomy. Following collapse of the lung, fragments of tooth were expelled. Later, owing to the lung creeping out, the symptoms returned and a thoracoplasty was done. Following this a still larger fragment of tooth was coughed up, since when the patient had remained perfectly well. 5. That of a man wounded in the neck by shrapnel, which caused mediastinal suppuration and chronic pneumonia. The consequence of this was bronchiectasis with offensive sputum. The shrapnel in the base of the lung escaped notice until an X ray was taken with very oblique rays (from above downwards). Phrenic evulsion was done, paralysing that dome of the diaphragm. Since then there had been disappearance of all symptoms.

The second part of the paper was devoted to a description of the value of phrenic evulsion and thoracoplasty. Phrenic evulsion had superseded phrenicotomy because it broke the continuity of the accessory phrenic as well as the phrenic itself. It was therefore much more effectual and almost constantly resulted in paralysis of one-half of the diaphragm, the dome on that side rising up into the thorax and producing partial collapse of the base of the lung. The operation was of value for basal tuberculous and bronchiectatic lesions of the lung; for abolition of diaphragmatic cough; for relief from vomiting associated with coughing; as an aid in cases of partial pneumothorax; as a means of reduction of the pleural cavity in cases of chronic effusion; as a preliminary to thoracoplasty, as a means of testing the resisting capacity of the opposite lung; and was a prophylactic measure against onset of bronchiectasis in cases of unresolved pneumonia. The statistical results of thoracoplasty were practically the same as those for pneumothorax—i.e., 35 per cent. healed, 30 per cent. improved, 35 per cent. uninfluenced or worse. The operative mortality was about 8·5 per cent. It was indicated in unilateral (or mainly unilateral) cases of tuberculosis in which there were extensive mechanical changes and in which artificial pneumothorax was impossible owing to adhesions; also in unilateral bronchiectasis. Slides were shown illustrating the collapse of the lung and chest wall, and the comparatively slight resultant outward deformity.

Reviews and Notices of Books.

THE LIFE OF SIR WILLIAM OSLER.

By HARVEY CUSHING. Oxford: At the Clarendon Press. 1925. In two volumes. Vol. I., pp. 685; Vol. II., pp. 686, and Index. 37*s.* 6*d.*

Osler was the son of a Canadian rector who held the livings of Ancaster and Dundas not far from the Western end of Lake Ontario, and the boy was fortunate in his teachers, who were a cleric, William Arthur Johnson, and James Bovell, who only took orders late in life, but at the time when Osler was his pupil was a medical man and dean of the medical department of Trinity College, Toronto. They were both remarkable men and somewhat eccentric. They clearly possessed a large share of Osler's affection, and though their methods of teaching must have horrified their stereotyped colleagues, they evidently exercised enormous influence upon their pupil. Dr. Cushing gives many letters from them both, and in one from Bovell, who was notoriously absent-minded, we find a sidelight upon Osler's possible choice of a career and also an example of the teacher's wandering mind, for the letter is dated August, 1870, and he says to Osler, "I do hope you will work on, for I have quite made up my mind that you are to get a first-class for the East India Company." The East India Company was handed over to the Crown in 1858, and had therefore ceased to exist. From Toronto Osler passed to the medical school of McGill University, where he was appointed quite shortly professor of the Institutes of Medicine, being then only in his twenty-sixth year. In 1884 he left Canada, to the deep regret of his colleagues, for the United States, being elected professor of clinical medicine at the University of Pennsylvania. And in 1888 came the call to the Johns Hopkins University at Baltimore as professor of medicine and physician in charge of the medical department.

One of the outstanding incidents of his Baltimore days was the publication of the "Principles and Practice of Medicine," the result of clinical studies based alike on personal experience and on theories fortified by the wide consultation of the best German, French, and English authorities. The book was written with difficulty; we can see that Osler was consumed with the desire to write it, but painfully aware of the labour that he would be undertaking, and of the calls that the task would make on his over-occupied time. However, the task was steadily accomplished, and the work was recognised at once as a great acquisition to medical literature. There were at the time several books, notably those of Taylor, just issued, Bristowe, Roberts, and Fagge, which covered the range of medical study to the satisfaction of students and of their examiners, but Osler's treatise appeared at a time when not only modern developments required recording, but when a new spirit of approach was badly needed in response to altered central conceptions concerning disease. The observation, lucidity, and powers of judgment displayed made the book an immediate success, for the author contrived to give the lessons to be learned from the latest pathological investigations in combination with his own personal clinical observations, while he boldly accepted new theories of disease and new classification in accordance with the progress of knowledge. It was at Baltimore also that he developed the admirable plan by which clinical medicine should come directly within the sphere of University training, being placed alongside the other great faculties, the associated hospitals and institutions being regarded as schools of the University. With such a record it is not surprising that, when in 1905 he was appointed Regius Professor of Medicine at Oxford, the mother country was ready to welcome her great Canadian recruit.

The second volume of the book is largely given up to a description of Osler's Oxford career, a career

in which he was not only happy to himself but a source of incomparable happiness to others. After the strenuous hustle of American life the atmosphere of Oxford appealed particularly to him. He delighted in the congenial society, and the duties gave him ample scope for his activities and free play for his broad outlook on life, facts which are proved over and over again by the correspondence included in the volume. We have here also a very full picture of the war, for Osler, it will be seen, was a firm link between the medicine of America and Canada and that of the Allies. We can see from the letters included that throughout the protracted struggle he worked heart and soul for the sick and wounded, and when the blow fell that saddened the end of his life by depriving him of his only son, he reacted to it by a deeper immersion in innumerable duties in connexion with the hospitals under Canadian and American control. On p. 577 is an extract from a diary kept by a brother officer of young Revere Osler, describing his burial: "A strange scene—the great-great grandson of Paul Revere under a British flag, and awaiting him a group of some six or eight American army medical officers. . . ." The significance of the note is that Paul Revere, after whom young Osler was named, was the notable revolutionary who made the famous midnight ride in 1775 from Charlestown to Lexington to warn the population of the landing of the British.

These large volumes bring before us the manner of man that Osler was by the recapitulation of internal evidence. We see him as one with unbounded powers of sympathy, kind, learned, and humorous, a model physician and teacher, and a reformer. He was able to combine deep respect for all that the old offered which was worth retaining, and with this acute perception of the debt owed by the present to the past, he possessed an equally acute perception of the directions in which reliance upon what had gone before can be placed as a guide to what should come. There is ever a tendency for one who essays to put on paper the portrait of a rare and charming personality to record every scrap of fact or detail which may throw a light upon his subject; the result may then be to demand from the writer exceptional qualifications. Not that we mean by this that he need be either learned or literary—both of which Prof. Cushing distinctly is, and neither of which was Boswell, the classical biographer for all time—but he should have great powers of assimilation so that the homogeneous information can be mentally digested and arranged before it is published—that is, if he wishes to write a popular book. Prof. Cushing has (and rightly) as profound an admiration for Osler as Boswell had for Johnson, but many will find that he has allowed his biography to be overloaded with details some of which obscure instead of throwing light upon the hero. It would be fair criticism to say that the result of more concentration would have been likelier to obtain for a life of Osler the popularity which it deserves, but it would certainly be quite unfair to blame the author for not having done what he has never attempted to do, or to assume that he could not have done it if he wished. Prof. Cushing has decided to give us all the information that we may digest it and make the great deductions for ourselves from a work of the highest interest.

PSYCHIATRY.

The Inheritance of Mental Disease. By ABRAHAM MYERSON, Professor of Neurology, Tufts College Medical School. London: Baillière, Tindall and Cox; Baltimore: Williams and Wilkins. Pp. 336. $5.

WITH this volume Prof. Myerson presents in an authoritative and lucid manner the results of many years' study of the hereditary factors of mental disorder. He discusses the whole conception of insanity and shows that, by departing from the use of the term "insanity," the approach to the subject as a group of "diseases of the human being to be studied in a naturalistic manner and clinically" is made more easy. He takes the attitude that there are independent groups of mental diseases, some of which he finds to have no hereditary value, while others run in families. He criticises the various theories of the heredity of mental disease and is inclined to the view that the transmissible mental diseases are not really hereditary characters in the same sense as stature or blue eyes, for example, but that they merely represent diseases caused by unknown agents whose effects persist over two or more generations and from which a stock may either recover or die out. Finally, he deals with the value of the problem in the racial life, for, as he says, "if a true heredity is involved, then our humanitarian efforts are injurious to the race, but if the problem is not one of heredity, then our social efforts are racial efforts and our noblest strivings have a eugenic backing."

The work is admirably presented. Prof. Myerson departs entirely from the text-book style of description; he takes the most prominent symptoms and describes them in such simple language as can readily be understood by those unfamiliar with the technical phraseology of the psychiatrist. In his grouping of mental diseases he takes a toxic group, a psychoneurotic group, an epileptic group, a feeble-minded group, and a group of five mental diseases, of which the underlying pathology is as yet somewhat obscure. These "conditions" (a term which he prefers to "disease") are dementia præcox, manic-depressive insanity, paranoid psychoses, involutional diseases, and senile dementia. It seems probable to him that in all the periods of life there occur three main types of mental disease: the first is a paranoiac type with hostility, suspicion, a deluded interpretation of the life around, and a gross egoistic over-evaluation of the self; the second is a dementing disease whose prototype is dementia præcox, but which occurs in modified form in the involutional and the senile periods; while the third is a disease marked mainly by a depressive mood with lowered energy, absent interest, and delusions of a depressive and apprehensive nature, occasionally associated with excitement and exaltation. Whatever their cause, the less resistant individuals develop these conditions early, others remain normal until the change of the involution, and still more resistant individuals develop them late in life.

The remainder of the book consists of a detailed and thorough exposition of the material which the author has collected during the years in which he has been working. He divides it up into sections dealing with the transmission of specific mental disease in the vertical line and the transmission horizontally. He concludes as regards the vertical transmission: (1) That the paranoid disease tends to paranoid states, perhaps finally to dementia præcox. (2) That the manic-melancholic diseases are in the main followed out, but in a certain number, especially in doubtful cases, they may be followed by dementia præcox. (3) That the involutional and senile state, if paranoid, trends towards paranoid states and dementia præcox. (4) That the manic-depressive states of involution and the senium trend towards manic-depressive states and dementia præcox, especially the latter. (5) That dementia præcox in an ancestor trends towards dementia præcox in the descendants with a certain scattering incidence of imbecility. (6) That neither for organic disease nor for alcoholic disease can anything definite be said. The conclusions concerning the horizontal transmission are as follows: (1) The psychoses of brothers and sisters tend on the whole to be alike. (2) An apparent exception is the frequency of the statement that one or other of the brothers or sisters with dementia præcox is also mentally defective. This he believes to be due to the more early occurrence of the disease, and his observations corroborate the belief of Kraepelin that some cases of feeble-mindedness are really early cases of dementia præcox. (3) His own experience throws doubt on the occurrence of typical mental defect and typical dementia præcox in brothers and sisters. He says: "It will thus be seen

that brothers and sisters are more alike in types of mental disease than are parents and descendants. This is what one would expect if there is a greater similarity biologically and socially between members of the same generation than between members of two generations."

The book ends with a warning against any attempt to influence legislation in a eugenic direction. Prof. Myerson recognises, however, a basis for the demand that no one should be allowed to conceal the fact of mental disease when entering upon marriage, and that such concealment should be a cause for annulment. He advocates sterilisation of those types of feeble-mindedness which are known to run in families, and he is of the opinion that wherever mental disease exists in a family group for more than one generation it would be wise for society to sterilise those of the second generation who pass into institutions. "I do not believe," he says, "that we can ask much more than that in the present state of our knowledge, and we cannot afford to be unduly dogmatic. The common sense and stolidity of legislatures, what seems to be stupidity, is often enough justified by the dogmatic attitudes of science, a dogmatism hard to understand by one who knows the history of the theories of science."

This work is in every respect a valuable contribution to the literature of the subject and can be recommended to all concerned with these branches of science.

Heredity in Nervous and Mental Disease. By Various Authors. New York: Paul B. Hoeber. 1925. Pp. 332. $3.75.

THE third volume of the reports of the Association for Research in Nervous and Mental Disease is an important contribution to the subjects there reviewed. The work is divided into five sections. The first deals with general considerations, including the rôle of the cell and the chromosomes and the significance of exogenous and endogenous factors in heredity. This contains an excellent review by Dr. Charles Metz of work in connexion with the examination of the chromosomes of the fruit-fly, Drosophila, which is of the highest importance and interest. There is also a paper by Dr. L. F. Barker on the significance of certain factors, such as consanguinity, race, and alcoholism, in the development of the heredo-familial diseases of the nervous system. The second chapter is a study by Dr. Smith Ely Jeliffe of the parts of the central nervous system which tend to exhibit morbid recessive or dominant characters, and outlines the work carried out by many observers in connexion with the hereditary aspect of nervous and mental disease, such as the familial muscular dystrophies, disseminated sclerosis, epilepsy, and dementia præcox. Chapter III. deals with the pathology of diseases of known hereditary tendency, particularly Freidreich's ataxia, amaurotic family idiocy, Leber's disease, and retinitis pigmentosa. A final section, by Dr. Charles R. Stockard, gives an account of the experimental work he has done on the production of congenital malformations by means of chemical traumata. The fourth chapter considers Heredity in the Psychoses, the hereditary and familial factors being dealt with by Dr. A. M. Barrett, the pathological changes in patients dying from hereditary and familial psychoses by Dr. S. T. Orton, while Dr. C. B. Davenport discusses the proportion of feeble-mindedness in such hereditary conditions. An interesting chapter is contributed by Dr. J. Collins on the attitude of the novelist to the hereditary factor in life.

The book is enriched by many excellent histological plates and genealogical tables and other illustrations, and includes discussions which took place in the society, following the presentation of the various papers. The wide scope and detailed survey of the field of research given in the volume render it a work worthy of careful and diligent study on the part of those interested in the hereditary aspect of mental and nervous disease.

THE MEDICAL, DENTAL AND PHARMACY DIRECTORY OF SOUTH AFRICA.

Edited and published by EWALD HERBERT. Johannesburg. 1924. Pp. 259. 15*s.* 6*d.*

THE area covered by this directory includes the Union of South Africa, Northern and Southern Rhodesia, and South-West Africa, Basutoland, and Swaziland Protectorate. The greater bulk of the volume is taken up by useful information relating to the Union of South Africa. The personnel of the Department of Public Health is detailed and that of the medical councils and pharmacy boards of each of the provinces; the principal medical officers of the Department of Defence are named and also the medical and lay members of the Council of Public Health. Medical, dental, and pharmaceutical societies are listed, with their presidents and secretaries. The names, qualifications, and addresses of practitioners (*a*) of medicine, (*b*) of dentistry, (*c*) of pharmacy are then set out first in alphabetical order, and then geographically according to the town of residence. An account of the medical schools, hospitals, and district surgeons concludes that part of the volume devoted to the Union of South Africa. Corresponding particulars are given in respect of the other countries.

It is noted in the preface that the directory has been brought out under great difficulties, since no penalty is imposed on practitioners who fail to notify change of address in South Africa; official registers are thus not always reliable, and it is difficult to trace the movements of practitioners.

Generally speaking, the medical and dental degrees and diplomas of Great Britain and Ireland, which are registrable in Great Britain, are recognised in the Union. But those who hold foreign degrees or diplomas are advised to write to the council or board under whose jurisdiction they propose to practise, in order to ascertain if they are entitled to practise there.

THE PEARL OF FORTUNE.

A Tale of the South Seas. By Lieut.-Colonel T. R. ST.-JOHNSTON, C.M.G. London: Selwyn and Blount. 1925. Pp. 261. 7*s.* 6*d.*

Dr. T. R. St.-Johnston, of the Colonial Civil Service, has to his credit already an interesting volume of South Sea reminiscences, a work on the ethnology of the Pacific Islanders, some verse and fairy-tales. To this rather unusual literary output for a medical man he now adds a sensational novel concerning the discovery on a deserted coral island of a priceless pearl. There were three men only on the island at the time; one found it, one legitimately succeeded to it as a trust, and most of the book is taken up with the attempts of the third, essentially a "bad man," to obtain it, being stimulated not only by ordinary dishonest greed, but by a well-described passion for revenge. The story, while running on familiar general lines, is made interesting by the special knowledge the author is able to display in the *mise-en-scène*. We will not spoil it for the reader by detailing the way in which the interest is sustained by the temporary success and ultimate failure of the villain's designs.

JOURNALS.

QUARTERLY JOURNAL OF EXPERIMENTAL PHYSIOLOGY. Vol. XV., No. 1.—Contributions to the Physiology of Gastric Secretion: I. Gastric Secretion by Local (Mechanical and Chemical) Stimulation, by Robert K. S. Lim, A. C. Ivy, and J. E. McCarthy. The investigations were carried out entirely on dogs provided with gastric pouches or fistulæ. The various kinds or types of fistulæ used by different observers are described and illustrated. Some observations on normal men are included for comparison, and radiographs of the entire stomach pouch after meals are figured. A long historical account of previous observations on local mechanical and chemical stimulation is given with well-documented references to the original

papers, and the authors' experimental results are recorded. The mechanism concerned in gastric secretion is discussed and the following working hypothesis is suggested. All stimuli that excite gastric secretion act essentially by increasing the active blood-flow through the gastric glands; the means by which this is accomplished may be quite varied, the motility of the stomach being in some way involved. This view is not held to the exclusion of others, for the enteric reflex may play an important rôle. But since this mechanism does not suffice to explain the secretion to meals in the denervated pouch, and since all attempts up to the present have failed to prove a hormone or humoral mechanism, the authors believe it is better to adopt a hypothesis which offers a common mechanism, and they claim that their observations offer a satisfactory explanation for at least a part of the hypernormal gastric secretion ("hypersecretion") that is observed to occur in cases of pyloric obstruction. The factors concerned in the excitation of gastric secretion are: (1) The cephalic phase, heretofore referred to as the "psychic secretion" demonstrated by Pavlov, which is excited chiefly by the taste, smell, and mastication of palatable food, and by slight or hypnotic suggestion of palatable food. The term "psychic secretion" is rejected because it is not necessarily psychic, as it has been shown to occur in the absence of the cerebral cortex. (2) The gastric phase, in which mechanical and chemical stimuli are effective. (3) The intestinal phase, in which the stimuli are certain chemical substances acting in the intestine as proved in the next paper by the same authors, entitled "The Intestinal Phase of Gastric Secretion." The intestinal phase of gastric secretion, they hold, is due to the action of the products (e.g., peptone, amino-acids, and amines) of digested complex food substances and not apparently to the food in its raw state (meat, carbohydrates, and neutral fat). Water in the intestine stimulates, but not invariably. Gastric secretion may be stimulated from the intestine by a non-absorbable substance—namely, 0·5 per cent. saponin solution. The authors conclude that their observations definitely disprove the specific pyloric or gastric theory as originally stated by Edkins, and maintain that their observations demonstrate that the intestine as a pathway for the stimulation of gastric glands must be considered in an analysis of the factors concerned in the genesis of gastric secretion. In short, the existence of an intestinal phase is proved.—The Effect of Lesions of the Hind- and Mid-brain on Micturition in the Cat, by F. J. F. Barrington. In previous publications the author had shown that two of the reflexes which go to make up micturition do not in the cat arise in the cord but in the brain stem, at approximately the level of a plane through the posterior part of the inferior colliculi dorsally and the middle of the pons vertically. These two reflexes are the only two which produced a powerful and sustained bladder contraction, and to their abolition the suppression of micturition resulting from transection of the spinal cord is apparently due.—Alterations in the Form of Mammalian Erythrocytes in Hypotonic Plasma, by Eric Ponder and W. G. Millar. The authors find that the diameter of the human erythrocyte becomes less as the cell volume becomes greater, and this condition is typical of the behaviour of a balloon-like body. They conclude from their own results, and from those of other observers, that the red cell may be treated as a balloon-like body—i.e., is composed of a membrane containing a fluid or a semi-fluid material, probably a colloidal system, and is not, as suggested by Rollett, composed of a dense stroma in the meshes of which the hæmoglobin is contained.—Action of Adrenalin on the Perfused Fish Heart, by A. D. Macdonald.

Reports and Analytical Records.

"HYPOLOID" BISMUTH METAL.

(BURROUGHS, WELLCOME AND CO., SNOW HILL BUILDINGS, LONDON, E.C.)

"HYPOLOID" bismuth metal in isotonic glucose solution (0·2 g. in 1 c.cm.) has been prepared by Burroughs, Wellcome and Co. as an additional remedy against syphilis. It presents metallic bismuth, now recognised as a definite spirillicide, in the form best suited for intramuscular injection. The isotonic glucose solution allows uniform absorption to take place and practically eliminates abscess formation if the proper technique for intramuscular injection is observed. The required dose is drawn up direct into the syringe barrel by puncturing the rubber cap with the syringe needle and withdrawing the piston to the requisite mark on the barrel. On withdrawing the needle the aperture in the rubber cap closes automatically and reseals the container. The preparation is supplied in rubber-capped bottles 5 c.cm. and 10 c.cm. The commencing dose suggested is 1 c.cm. at each injection.

SQUIBB'S MINERAL OIL, "LIQUID PETROLATUM (SQUIBB)."

(QUELCH AND GAMBLES, LIMITED, 211/215, BLACKFRIARS-ROAD, S.E.)

It is claimed for this Californian oil that it differs in essential respects from other American oils, and is superior to Russian oils. As a mechanical lubricant for internal use the purity of an oil is of importance, and this preparation is stated to be free from inorganic matter, organic sulphur compounds, or injurious hydrocarbons. Colourless, odourless, and tasteless, it has a high specific gravity and a high natural viscosity, the index of lubricating power. The usual dose is one tablespoonful twice a day between meals, one of the doses being taken on going to bed; but the dose can be later increased or decreased according to its effect. For children and infants smaller quantities are, of course, necessary than for adults.

BERINA FOOD AND BERINA MALTED MILK.

(MONTGOMERIE AND CO., LTD., IBROX, GLASGOW.)

We have received from this firm, who are the proprietors of Bermaline bread, a food specially prepared for infants and a preparation of malted milk designed as a diet when necessary for children of a few months old. The ingredients are stated to be whole cream milk, cream of wheat—a short extraction of flour from the wheat berry—and lactose, malt being added in the second preparation. The malt is a product of Scotch barley, and is prepared by the firm at their own maltings. A pamphlet is supplied with both preparations giving careful directions for use, with tables of dosage for the different ages. In this pamphlet a prudent insistence is laid upon the fact that no more food should ever be prepared at one time than is required for immediate use.

TRIVALIN.

(THE SACCHARIN CORPORATION LIMITED, 72, OXFORD-STREET, W.)

We have received samples of trivalin capsules and ampoules from the Saccharin Corporation Limited. Trivalin is a combination of caffeine valerianate, cocaine valerianate, and morphine valerianate in certain proportions selected so that the undesirable properties of one drug should be counteracted by the action of the others, with a proportional development of the beneficial properties. It has been used as a substitute for morphine, and medical evidence is forthcoming as to its value as an anodyne. It is supplied in ampoules for hypodermic injection of 1 c.cm., each containing gr. 1/17 caffeine valerianate, gr. 1/12 cocaine valerianate, and gr. 3/10 morphine valerianate, the dose being from ½ to 1 c.cm. once to thrice daily. The capsules are contained in bottles of 12, one capsule to be taken once to thrice daily by the mouth.

THE LANCET.

LONDON: SATURDAY, MAY 16, 1925.

HEREDITY IN MENTAL AND NERVOUS DISEASE.

THE transmission from parent to offspring of mental and physical characteristics has been accepted as a fact from the beginning of time, but this principle cannot be applied to disease processes quite so simply. The complex living organism is made up of a number of individual entities together composing the whole, and in the consideration of the transmission of qualities the questions at once arise: Does the innate characteristic of the individual persist unchanged and is it transmitted in its unchanged form, or can the characteristic be modified during the life of the individual, and can this modified characteristic be transmitted? The Mendelian laws showed that in comparatively simple organisms, with clearly recognisable traits, the innate characteristic persisted and that the manner of its appearance in the progeny could be mathematically computed. The advent of Darwinism and the theory of sporadic variation further deflected attention from the second possibility, but opinion now shows a trend towards the neo-Lamarckian attitude which affirms that the acquired modification may, under suitable circumstances, be passed on. The Mendelian law is very hard to apply in the complex organism and more particularly in the field of disease. It is difficult, in the first place, to pick out the definite fundamental trait, the unit characteristic; what appears unitary may, in fact, prove to be highly complex. Apart from a very limited group of abnormalities, such as hæmophilia, albinism, and certain familial myopathies, very little in this line has actually been accomplished beyond the establishment of a certain persistence of characteristic in a family tree.

In medicine it has been the custom to introduce the heredity as an ætiological factor in disease, especially in cases where no other definite causative factor is known. The history of pathological research, however, offers many instances where the hereditary influence was once supposed to be the all-important agent, when further advances in knowledge have shown the disease to be one acquired in the life-time of the individual. In such cases, even where the disorder has been definitely proved to be due to an environmental cause, such as the invasion of micro-organisms, the exponents of the hereditary theory merely change their ground and speak of a "diathesis" or a "constitutional tendency." Prof. ABRAHAM MYERSON, in a work reviewed in our columns this week, emphasises this point in relation to tuberculosis. He says:

"Up till Trudeau's time, in fact right up to the discovery of the tubercle bacillus by Koch, the main factor in the causation of the disease was held to be heredity. There were plenty of families found in which tuberculosis occurred 'generation after generation,' plenty of families found in which all or many of the brothers and sisters had the disease, the same kind of evidence we have to-day for the 'inheritance of insanity.' . . . With the discovery of the infecting organism as a cause of tuberculosis heredity received a knock-out punch; in fact, everyone now loudly proclaims that there is no heredity in tuberculosis, but instead the metaphysical 'predisposition' is acclaimed, and still lingers to obfuscate intelligent thinking."

The real obstacle, as it appears to us, in the way of any advance in our knowledge of the hereditary transmission of disease lies, firstly, in the difficulty of finding a "unit character." There are few diseases which can be so regarded; the majority are symptomatic groupings. Particularly does this apply to mental and nervous disorder, of whose ultimate nature we have at present little accurate knowledge and concerning which it is probable that future research will radically alter our conceptions. Secondly, we do not know how far a certain grouping of symptoms may constitute a biological reaction to certain specific environmental circumstances. Because a certain symptom-complex appears in a national or family grouping it does not necessarily follow that the cause lies within. There is a strong measure of probability in the alternative explanation—viz., that the mechanism of biological adaptation to the environment is producing a similar series of reactions in a number of individuals exposed to the same conditions. Thirdly, we are remarkably ignorant of the laws governing degeneracy, atavism, or simple failure of development. It is a matter of consideration whether a number of the disease entities now recognised are not phenomena of this order rather than disease processes proper.

The progress of *homo sapiens* has been not biological but sociological; it has depended upon his control of and ability to grow at the expense of his environment. The development of man is not reckoned in terms of biology but in terms of his capacity for using materials—the Stone Age, the Bronze Age, the Age of Steam. There has been steady progress in the manipulation of the environmental factor, and it may be that the hope of medical science lies in a further extension of this principle. It is a comforting reflection that the history of medicine shows a steady tendency to eliminate the hereditary in favour of the environmental cause as the knowledge of morbid processes has become more explicit. For it is still a question whether the advance of the human race depends upon the adaptability of man to his environment or upon his capacity for adapting the environment to himself.

THE DYNAMICS OF THE CELL.

IN man's scientific struggle to bring under his direct control all the reactive phenomena exhibited by the animate and inanimate world, progress has been conditioned to a large extent by his power of analysing the concrete basis of his research into particles of ever increasingly minute dimensions, and of defining the laws governing their mutual interaction. Physics and chemistry are approaching each other on the common ground of atomic and molecular dynamics. Physiology, towards which medicine must unceasingly look for a rational interpretation of the problems which confront her, is on her part largely dependent, and ultimately entirely so, on the physico-chemical elucidation of the structure of matter. Without in the least wishing to disparage experimental work done on the whole animal and especially on man—work to which physiology and medicine owe a great and lasting debt—we cannot refrain from emphasising the tendency at present exhibited in physiology to make use of the synthetic method of experimentation. Such a method of study—namely, the study of the functions of an organ isolated from the disturbing and uncontrollable influences of the rest of the body—enables a much more exact determination of the reaction of the individual organ to changes in environment to be made than would otherwise be possible.

Witness the mechanism of muscular contraction and the law of the heart, to mention but two results of fundamental value obtained by this means.

Clearly the individual cell forms a still more particulate field for study—one striking even more deeply towards those basal reactions which are at the root of all natural phenomena. Prof. J. B. LEATHES, in the undelivered Croonian lectures for 1923, the last of which we publish to-day, focuses attention in a fascinating manner on the structure of the cell and especially on the part played by fats in the cytological reactions which manifest themselves in such divers ways in vital phenomena. Protoplasm we know to behave as a colloidal solution; when observed under the ultramicroscope particles in Brownian movement can readily be seen. These particles have usually been looked upon as protein aggregates and to account for the high viscosity exhibited by the protoplasm; the colloidal solution has been considered to conform to the emulsoid rather than the suspensoid type. That is to say, the dispersed phase consists of aggregates containing a dilute solution of protein in the interstices between the molecules whilst the continuous phase is a dilute solution of the protein. The cell membrane itself will be composed of any substance which lowers surface tension, this quantity by the principle of WILLARD GIBBS always striving to become a minimum. Proteins, therefore, will be concentrated in this position, a fact which is readily demonstrated in the surface condensation experiments of RAMSDEN, or more familiarly in the formation from egg-white of froth which speedily takes on the irreversible rigidity of the meringue. The cell membrane must be looked upon as an intimate and living part of the cell—a portion, indeed, which is in dynamic equilibrium with the constituents of the cytoplasm, and changing its structure with any change in the internal composition of the cytoplasm. The membrane of the resting cell is almost perfectly semipermeable—that is, freely permeable to water but impermeable to the majority of physiological crystalloids. Changes in permeability, however, readily occur. We may mention the decreased electrical resistance of Laminaria cells when transferred from sea water to solutions of pure sodium chloride. Heliotropic curvature in plants is an index of increased permeability of, and, therefore, loss of turgor by, those cells directed towards the light. Excitation is accompanied by increased permeability, whilst narcotics, as would be expected, have the reverse action.

But it is to the presence and state of fat in cells and cell membranes that Prof. LEATHES directs special attention. That fat forms an intimate and essential part of the structure of the cell is shown by the fact that in starvation the wasted tissues—adipose tissue, of course, excepted—do not lose a disproportionate amount of fat. This cell fat is found in at least two physical states—namely, as small particles in the cytoplasm and as the lipoid component of the cell membrane. An explanation of the coexistence of a continuous lipoid membrane and dispersed fatty aggregates may, perhaps, be found in the study of the behaviour of fatty substances when forming films at an air-water interface. The physical properties of substances in this condition are very different from those of the same substance in bulk. These properties have been studied by LANGMUIR and by ADAM. By means of an ingenious arrangement it has been shown that unimolecular films are formed when fatty acids spread on water, the molecules being oriented in a definite direction perpendicular to the surface. The polar group of the molecule is attached to the water, and the kinetic energy of the molecules of the latter is imparted to a certain degree to the molecules of the film causing a much greater intermolecular distance than is exhibited by the same substance in mass at the same temperature. The films may exist in two main forms, either in the condensed state, when the substance is in reality a two dimensional solid or liquid, or in the expanded state, a two dimensional gas. Prof. LEATHES has extended this work in a study of the films formed by lecithin and by cholesterol, lipoids which enter so ubiquitously into the formation of the cell membrane. The former is found to form a highly expanded film, the latter a condensed one. Indeed, the myelin outgrowth from the surface of lecithin in a watery medium is an expression of this tendency to form an expanded film. Clearly any interpretation of cell structure which fails to take into account the extraordinary properties of unimolecular layers of fats and lipoids must inevitably be short-lived. Prof. LEATHES points out that it is impossible to account for the properties of the cell substance by the aid of protein alone, and "if in order to understand the physiology of cells it is necessary to take into account interfacial phenomena, it is fats rather than proteins that we must look to to provide the interfaces."

We commend the lectures to the close study of our readers. It is such work as is embodied in them which bids fair to expose the secrets of cell life, and so give us an ever clearer and more valuable insight into the nomocracy of vital phenomena.

THE CONTROL OF VACCINES: AN APPEAL TO PARLIAMENT.

WE feel confident that the medical profession will support the appeal we make to Members of Parliament to pass the Therapeutic Substances Bill at an early date. This useful little measure, which now awaits a second reading in the House of Commons, has already attained a third reading in the House of Lords three times—in July, 1923, in May, 1924, and in March of this year. It seeks to secure the standardisation and purity of certain substances, such as vaccines, sera, salvarsan, insulin, and pituitary extract, which are incapable of analysis by ordinary chemical process.

In the field covered by the Bill, England at present lags behind other civilised countries. The United States, France, Italy, Spain, Germany, Norway, and Sweden submit the manufacture of these substances to the most rigid inspection. Denmark has gone even further and insists that all such preparations be made in State laboratories only. There is no occasion to go thus far in England where private firms have established so high a standard of manufacture. But undoubtedly it is urgently necessary to set up and enforce tests of purity and potency. Fatal cases have occurred because the practitioner has no certain guide to the strength of some of the new and indispensable remedies which scientific research has placed in his hands. Some of these substances are highly poisonous unless prepared in properly graded quantities. In practice a doctor acquires with immense care and caution an experience of the activity of pituitary extract supplied by a particular firm. If accident or emergency compel him to depend upon the product of another firm, he is working in the dark for want of the uniformity which this Bill is designed to create. His accustomed prescription may prove equally dangerous because on the one hand it has not the efficiency upon which he is relying, or because on the other hand its unsuspected strength amounts to an overdose. At present there is nothing to prevent this country from being flooded with preparations which the other countries

named above have already rejected for bad quality. There is nothing to ensure that imported preparations shall conform to the careful standards which British manufacturers have severally established for themselves. If we delay much longer and if an international convention is signed before any official body in this country is authorised to standardise British products, we shall find that American and Continental manufacturers will be able to sell their products here while British products will be refused in America and on the Continent.

The Bill contains adequate safeguards and will secure uniformity of standards of authenticity and activity. The Minister of Health, the Secretary for Scotland, and the Minister of Home Affairs for Northern Ireland, acting together as a joint committee, are directed to consult an advisory council, which will include representatives of the Medical Research Council, the General Medical Council, the Pharmaceutical Society of Great Britain, and the Institute of Chemistry of Great Britain and Ireland. The Bill has suffered, it would seem, not only from its rather unhappy title, which is neither attractive nor explanatory, but also from its non-contentious character. Had it been more controversial, it would have excited more discussion and its purpose would have been more widely understood. It has aroused no hostility either from the medical profession or the manufacturers. The latter, indeed, as we stated when discussing the proposals in these columns in 1921,[1] are strongly in favour of the scheme because it protects both themselves and the public from the activities of those who are inefficient or dishonest. The Bill involves no bureaucratic extravagance and no horde of new officials. The testing will mainly be done by the manufacturers themselves, and the supervision will be undertaken by the Medical Research Council. Let it be clearly understood that, until this Bill is passed into law, lives are daily being needlessly endangered. The matter must not be left till the evidence at an inquest creates a sensation for the public and a panic for patients. The House of Commons will not wish to show itself indifferent to the perils of the present position.

THE INTER-STATE POST-GRADUATE ASSEMBLY.

THE Inter-State Post-Graduate Assembly of America, directed by the State Medical Association of that country, is visiting the British Islands during June. Opportunity will be taken to hold the Annual Congress of the Association on this side of the Atlantic, and the inaugural ceremony will take place on June 2nd at 9.30 A.M., at the Wigmore Hall, London, W., when the Duke of York will be in the chair. A reception will be held on the evening of the same day at Lansdowne House by the Princess Wiasemsky and Mr. Gordon Selfridge. The banquet in connexion with the Assembly has been arranged for Friday, June 5th, and by the permission of the Corporation of London will be held in the Guildhall at 8 P.M., Dr. Charles H. Mayo, of Rochester, Minnesota, presiding, while the chief speaker will be Mr. Neville Chamberlain, Minister of Health. On the following day the American Ambassador and Mrs. Houghton will give a reception to the Assembly at Crewe House.

The visit to London is part of an itinerary, which includes also Edinburgh, Dublin, Leeds, Liverpool, Manchester, Newcastle, Belfast, and Glasgow, and at all these centres arrangements of a social nature have been made. The general programme of the tour is in the hands of Mr. Philip Franklin, F.R.C.S., 27, Wimpole-street, London, W. 1.

[1] THE LANCET, March 5th, 1921, p. 497.

Annotations.

"No quid nimis."

TREASURY GRANTS TO UNIVERSITIES.

THE impartial distribution of the annual contribution from the Treasury among the universities and university colleges applying for State help is a formidable task. For several years it has been entrusted to the University Grants Committee to assess the relative urgency of the needs of some 50 institutions. The personnel of the committee consists of Sir William McCormick (chairman), Sir William Bragg, Sir Dugald Clerk, Sir Wilmot Herringham, Sir Arthur Keith, Sir Frederic Kenyon, and Sir Stanley Leathes. In academic circles the annual report of this representative committee is studied with at least as much anxious attention as the National Budget. The report for 1923–24,[1] recently issued, includes as usual, besides a table of the recurrent and non-recurrent grants allocated, full statistics of the institutions subsidised. Particulars as to number and age of admission of new students, the number of full and of part-time students, the proportion of students as to those of each sex in each faculty, and the number of degrees and diplomas obtained, as well as summaries of income and expenditure, are clearly set out in appendices. Incidentally, full-time students working in the faculty of medicine (including dentistry) throughout Great Britain amount to 10,864—8866 men and 1998 women—and even these big numbers do not indicate the total, since Guy's Hospital Medical School is not among the applicants for State aid. The corresponding figures for 1922–23 are 11,866 (9498 men and 2368 women), so that some diminution is shown.

A table that appears this year for the first time shows the salaries of the full-time teaching staffs at institutions other than Oxford and Cambridge. The salaries of the 623 professors average £977, and range from £550 (nine posts) to £2000 (seven posts). It is noted that of the 55 professors receiving salaries below £800, 36 work in the University Colleges of Exeter, Nottingham, Reading, and Southampton, and in the Durham colleges, and that in most institutions the minimum salary for a professor is £800 a year. The figures do not, the committee point out, indicate a very generous national conception of the rate of pay suitable to the highest class of academic worker; but they do not consider it desirable that any attempt should be made to lay down a uniform minimum salary for this or any other grade of university post in all places and in all subjects. Universities differ from one another in size, wealth, and standing, and a chair at one centre may carry a heavier load of work and responsibility than the corresponding chairs at others; again, different subjects, for reasons which may have little connexion with their intrinsic importance, occupy different places in the scale of values that reigns in the academic market. No examples are cited, but it is obvious that the highest professorial figure (£2000) represents a scale of pay below which it would be impossible to induce members of the medical profession to give up lucrative consulting practice in London for full-time service. The general systematisation of salaries would not, in the opinion of the committee, benefit university education and would tend to impede that free circulation of teachers through various institutions which is a valuable asset in academic life. However, the problem of the remuneration of the senior member of the lecturer grade is regarded as an urgent one, and a suggestion is made that individual service might be recognised by preferment to a special post which might be created for and need not necessarily outlive the holder.

[1] University Grants Committee. Report including Returns from Universities and University Colleges in receipt of Treasury Grant. Academic Year 1923–24. London: H.M. Stationery Office. 1925. Pp. 44. 3s. 6d.

During the year under review the committee paid a series of visits to institutions receiving grants, their previous visitation having taken place in 1919–20. They conclude that while real progress has been made in the intervening period, improvement is urgently called for as regards conditions of service of staff, and the provision of libraries and of material equipment in such departments as already exist, and that the responsibility for maintaining new departments should not be undertaken until the existing ones are put on a satisfactory basis. The social needs of students, especially more extended facilities for life in suitable residential halls, should also receive early consideration. These needs are recognised by the majority of the institutions and depend only upon increased financial resources. The increased grant-in-aid voted by the Treasury for the academic year 1925–26 is noted with satisfaction by the committee, who will have at their disposal £1,550,000 for that year in place of £1,242,570, which is the amount voted for the year 1924–25. The report throughout shows unmistakable signs of care to consider the highest interests of university education in this country from all possible points of view, and the committee deserve the gratitude of the public as well as that of the academic world for their labour.

THE SEROLOGICAL DIAGNOSIS OF SCARLET FEVER.

IN 1918 W. Schultz and W. Charlton stated that if serum taken from a normal person or from a convalescent case of scarlet fever was injected intradermally into the skin of a person with a bright scarlet fever rash there appeared after a time a complete blanching of the rash at the site of injection over an area from half an inch to a few inches in diameter. W. Mair [1] showed that Schultz and Charlton were mistaken in their claim in so far as related to the serum of a normal person who had not been rendered immune to scarlet fever. More recently the serum of horses immunised by means of the hæmolytic streptococcus, thought to be the cause of scarlet fever, has been used in the same manner to test its rash-blanching value. Quite apart from the question of the serum treatment of scarlet fever, this blanching power of the serum may aid in the differentiation of scarlet fever from rashes which resemble that disease. With this object a number of workers have been engaged in testing the value of this phenomenon in scarlet fever and to a lesser degree in other rashes. There is no practical method of standardising this serum, and hence variation in the blanching power of different sera is to be expected, and actually the blanching is found to vary. Yet the variability of the blanching reaction does not appear to be wholly due to want of standardisation, for the same serum can produce varying degrees of blanching in different individuals. Further, it occasionally happens that it fails to produce any reaction in a case that appears to be clinical scarlet fever, though reacting well in others. In such instances even the expert clinicians will remember their frailties and be prepared to admit that after all the serum test may be the better guide. There may be other explanations of this failure. For example, if a rash has been established some days it is possible that it might blanch less readily, and if it was a pronounced one perhaps not at all. This point has not yet received the attention that it no doubt will.

The Schultz-Charlton reaction varies in its intensity, in the size of the blanched area, in its time of appearance, and in the time it lasts. Further, it may vary with the amount of serum introduced and, as would be expected, it varies in the same person with differing dilutions of serum, though not always so if the dilution be not very great. The intensity of the reaction varies from the complete local blanching of the rash to a faint fading which is difficult to see. Complete blanching is common enough, but it is also quite usual to see in an easily observed and partially blanched area the punctæ of the scarlet fever rash. When human serum was used it was found that the size of the area varied from about half an inch in diameter to two inches, but the quantity introduced was from 0·7 to 1 c.cm. The horse serum, in dilution, now being used in doses of 0·2 c.cm. results in a blanched area, or partially blanched area, varying from about half an inch in diameter to one inch. The interval from the time of injection to the commencement of the blanching is usually from 12 to 24 hours, but it may unusually be postponed for even 48 hours, and has been observed as early as 3½ hours. The blanching usually remains clearly visible for about two days, though punctæ commonly reappear within the area earlier. On the other hand, the blanching may remain until the rash disappears, and even afterwards may show as a non-desquamating area surrounded by the usual pin-point and pin-hole desquamation. Further, it occasionally happens that the rash fades quickly without a blanching reaction arising.

This serological test has been applied to a number of other rashes, such as serum rashes, measles, rubella, influenza rashes, and other erythemata without blanching arising. The test is therefore a promising one from the point of view of differential diagnosis, but more observations are desirable to prove, if it can be proved, that the reaction occurs in scarlet fever only.

[1] THE LANCET, 1923, ii., 1390.

THE FUNCTIONS OF THE HOME OFFICE.[1]

A SCHEME has been set in motion for publishing accurate and authoritative information in an accessible form concerning the great Departments of State. The volumes are to be termed the "Whitehall Series," and it opens with Sir Edward Troup's book. If the excellent precedent thus formed is followed the series will be useful to all who are interested in the government of the country, and the number of people who to-day try to get an intelligent grasp of the principles upon which they are legislated for is an increasing one. Among these people are Members of Parliament themselves who do not take their seats, either in the Upper or Lower Chamber, as jurists or as administrators, and who are for the most part—we say it respectfully—as ignorant as many of us of how things are done at Whitehall. Civil servants, again, should find in these volumes information about other offices than their own, and municipal workers, students of administrative methods, and journalists will find them useful books of reference. How often do most of us want to know in whose jurisdiction a certain activity lies, and where to find detailed information concerning it? Sir Edward Troup, who was Permanent Under-Secretary of State for the Home Office from 1908 till 1922, is brief and modest, but we are glad to see that space has been made to include a history of the origin and development of the powers and functions of the Home Office, for over and over again it happens that the meaning of the legislation of to-day becomes clear when the conditions which gave rise to it, now forgotten, are brought to light. To a medical audience the chapters on police administration, on prisons and institutions like Borstal or Broadmoor, on the control of immigration and the question of aliens, and especially on the Factory Acts and workmen's compensation will be particularly welcome. We are glad to see that Sir Edward Troup states definitely that the time has arrived for a further consolidation of the Factory Acts, for we consider that the delay in introducing the Home Office Bill on the subject is most unfortunate. All who are in touch with the administration of these Acts know that the law requires amending, simplifying, and strengthening. Other sections of particular interest to our readers will be those dealing with intoxicating liquors and

[1] The Home Office. By Sir Edward Troup, K.C.B., K.C.V.O., Permanent Under-Secretary of State in the Home Office, 1908–1922. London and New York: G. P. Putnam's Sons, Ltd. Pp. 267. 5s.

dangerous drugs, and an informing chapter on public morals and public amenities.

The succeeding volumes of the series, as announced, are as follows: "The Ministry of Health," by Sir Arthur Newsholme; "The Admiralty," by Sir Oswyn Murray; "The India Office," by Sir Malcolm Seton; and "The Post Office," by Sir Evelyn Murray. The series is issued under the general editorship of Sir James Marchant.

AN UNUSUAL CASE OF PREGNANCY.

MANY cases of pregnancy have been recorded in which the woman was unaware of her condition, usually through sheer ignorance, until the moment of parturition, but it must be rare for a married woman with three children to go to term in a fourth pregnancy without any knowledge of her state, as occurred in a case reported by Dr. R. Beckers, of Brussels, in *Bruxelles Médical* for April 19th. The woman was 30 years of age and had three children, aged 3, 4, and 5. Her three pregnancies and confinements had been perfectly normal and there was no history of any gynæcological complaint. She woke one morning to find the sheets soaked with a clear and copious vaginal discharge and 24 hours later she was delivered of a living child weighing about 5½ pounds, labour being associated with the expulsion of a considerable excess of amniotic fluid. Inquiry into her history revealed that she had menstruated regularly each month for the usual number of days, that she had felt no movements, nor had she suffered from any malaise or digestive disturbance. The larger size of her abdomen had not attracted her particular attention since previous pregnancies had left the walls lax and she attributed any swelling to her habitual constipation. Her breasts had shown no alteration from the state in which they had been left by previous pregnancies. Dr. Beckers examined the patient about 20 hours before delivery and he found a uterus enlarged to the size expected at about five or six months, with very exaggerated ballottement of a fœtus, no movements of which could be felt, nor could any fœtal heart sounds be heard. The case is of interest both from the obstetric and legal points of view. It adds another to the list of cases where losses of blood at monthly intervals have occurred during pregnancy, which losses were indistinguishable from the phenomena of normal menstruation; and the hydramnios which was present could not be accounted for by any trouble in previous confinements, by any signs of cardiac or renal disease, the Wassermann reaction being negative. From the legal point of view the existence of pregnancy in a comparatively intelligent multipara without her knowledge is important in view of the responsibility of the doctor called in to deal with the first symptoms of labour in such a case.

APPLETON'S.[1]

REMINISCENCES of a great publishing house are always of interest, and those of the house of Appleton have a special interest for the medical profession owing to the amount of medical and surgical literature which emanates from that source. The founder of the firm was Daniel Appleton and the book business was at first merely a small section of a general store mainly devoted to dry goods. This was in 1825. By 1830 the general store had become solely a bookstore and in 1831 the first book was published. This was some 3 inches square, was entitled "Crumbs from the Master's Table," and from a reproduction, as an illustration, of two pages we see that it consisted of devotional commentaries upon certain texts of scripture, and was not, as stated, made up entirely of verses from the Bible. In 1832 appeared the book which was in a way the forerunner of the host of medical books hereafter to be issued, called "A Refuge in Time of Plague and Pestilence," being a devotional commentary on the 91st Psalm which the writer considered as entirely relating to plague. It appeared at an opportune time, for cholera was then devastating the country. The present head of the house, William Worthen Appleton, is the grandson of the founder, who seems to have had an innate flair for publishing. For the founder recognised the charm of Lewis Carroll's "Alice in Wonderland" at its first appearance and bought a number of sheets for publication in the States. He also brought out the "Uncle Remus" stories, and no doubt reaped the rewards of his perspicacity in both instances. To medical men his chief service was the part which he played in the publication of Osler's "Principles and Practice of Medicine," but the account given by Mr. Overton of the transaction is not altogether in accordance with that given in a letter from Osler himself, to be found in Prof. Harvey Cushing's biography, reviewed in another column of this issue. Appleton was, in addition, the publisher of Herbert Spencer's writings in the United States, and Mr. Overton gives some amusing letters from Spencer to his publisher which well show the wretched valetudinarianism of the former and his perpetual sense of injury. Thus he complains bitterly of his health: "You in common with most people do not understand what a thorough invalid I am. At the end of last August (the date of the letter is May 24th, 1901) I had rather too long a conversation with a gentleman who came to see me at Bepton, and the result was that I have never been up to my low level since; I have not taken a drive since last August, and for six months was never out of doors until a fortnight ago, when an experiment in a bath-chair did me great harm." For all this Spencer died in his eighty-third year. Mr. Overton's brochure will appeal to all lovers of books.

[1] Portrait of a Publisher; and the First Hundred Years of the House of Appleton. By Grant Overton. London and New York: D. Appleton and Company. 1925. Pp. 96. 3s. 6d.

THE DOUBTFUL VALUE OF IODINE IN TUBERCULOSIS.

TWO papers on the treatment of tuberculosis with iodine have appeared recently in the French medical press. They are typical of two widely different mentalities and schools of therapeutics. The one may be said to represent faith without reason, the other reason without faith. The first school is represented by the paper written by Dr. S. Bonnamour and Dr. P. Delore in the *Journal de Medécine de Lyon* for April 5th. The authors' presentation of their thesis is crisp, dogmatic, and admirably parsimonious in words. They state that iodine may be given by the mouth, by intramuscular injection, by inhalation, or by intravenous injection. It may be given in large or small doses, and a variety of preparations, ranging from the simple tincture to the semi-mystic "colloidal electro-chemical" preparations, may be tried. The authors then proceed to state the indications which are perfectly simple. If the disease is chronic, stationary, or, better still, in the pre-tuberculous stage, iodine is indicated. It is contra-indicated in those cases which do not terminate in recovery by natural means, "natural means" being a euphemism for freedom from medicamentary interference. In this paper there is no account of the rationale of treatment with iodine; even that notorious guinea-pig which has recovered from tuberculosis under a certain treatment is not dragged into the discussion. As for the clinical results of the authors' treatment, we learn nothing until the last three lines of their paper is reached, when we read that their results will be published in a later paper. Very different is the quality of the second paper, published by Dr. S. I. de Jong and Dr. J. Christophe in the *Presse Médicale* for April 8th. Before the war they carried out experiments on guinea-pigs which were infected with tubercle bacilli and treated with iodine in different ways. It was found that the action of iodine on the tuberculous processes was, if anything, detrimental. After the war, the authors tested the action of iodine on

40 patients suffering from pulmonary tuberculosis. They first gave iodine by the mouth in the form of the tincture, the dose of which was gradually increased. They found that nausea and gastric disturbances contra-indicated this procedure, which they abandoned in favour of intravenous injections of iodine methylate of hexamethylenetetramine. In most cases this treatment was well tolerated and could be continued for months with impunity. But as many as nine patients suffered from hæmoptyses during this treatment, and in 30 cases there was no evidence of even transitory improvement as a result of the injections. Only in ten cases could any improvement be noted, and in none of these ten did the improvement last long. In no case did tubercle bacilli disappear from the sputum or the temperature show improvement. A carefully documented report like this may not be palatable literature for the enthusiastic therapeutist who wants to be "up and doing," but it is bound to command the respect of all who consider therapeutics a science stripped of empiricism.

MALARIA UNITS IN PALESTINE.

MALARIA has played an important rôle in the historic development of Palestine, where the disease is attracting the close attention of the present Zionist organisation. In Palestine the malaria season coincides with the breeding of the main species of anopheles, commencing at the end of March and lasting to the end of December. Thus there are but three short winter months when the infection is quiescent. The Malaria Unit has spread its activities, the most important of which were the control demonstrations designed to establish the possibility of reducing malaria in Palestine on a large scale at a low cost. These demonstrations are described in the annual report for 1923 of the Malaria Research Unit at Haifa, which is maintained by the American Joint Distribution Committee in coöperation with the Government of Palestine. Simultaneously with these demonstrations the unit was enabled to amass a considerable amount of useful information regarding the prevalence of malaria in different parts of the country and to pay attention to the commoner species of anopheles. The permanent elimination of breeding places of anopheles has also been aimed at. In some cases coöperative drainage undertakings were stimulated by contributing to the communities part of the cost in money or in labour. The laboratory of the unit has contributed greatly to the success of the work. It examined thousands of blood-films for the determination of blood-indices, and in studying other special problems it has proved itself an important part of the general organisation of the unit.

PROTECTION OF UNDERGROUND WATER.

THE Ministry of Health has published a report of the Advisory Committee on Water[1] setting forth the conclusions of a subcommittee upon the protection of underground water-supplies against depletion and pollution. There is happily an ever-growing demand for a higher standard of purity in water-supply. There is also, it need hardly be said, an ever-growing demand for quantity in supply. The expansion of urban areas and the requirements of baths, sanitation, and street watering have multiplied the consumption of water per head of the population. We can no longer afford waste or want of coördination. We have, it is true, the Public Health Acts provisions as to sewage and nuisance, the Rivers Pollution Acts (hard as they are to apply), and the by-laws of local authorities as to cesspool construction and proper scavenging. But, as the subcommittee points out, the general provisions of the law seem directed towards protecting surface water rather than underground water. Science as applied to sanitation has evolved improved methods of sewage purification and refuse disposal. But science as applied to the engineering side of mining and of water-supply has also evolved improved methods of large-scale pumping. There is evidence, especially in colliery districts, that new perils assail underground water-supplies. The subcommittee describes the kind of case it has had to consider. Heavy pumping at a colliery opens out fissures and draws in sea water, thus increasing the proportion of salt in the well of a water company nearer the sea. An East Kent colliery pumps water from strata below the chalk and discharges it on the surface in large quantities; the result is that the water finds its way back to the underground sources of water-supply in a contaminated state. Another colliery elsewhere pumps huge quantities of water to waste within a water company's statutory limits. In Flintshire lead-mining operations have tapped the source of St. Winifred's well at Holywell, drying up what was part of the local authority's source of water-supply as well as destroying the virtue of a place of ancient pilgrimage. Such examples might be multiplied. A casual glance through our local Acts of Parliament will discover cases where the needs of water-supply have required protection in the grant of fresh powers to public undertakings. Meanwhile the common law of the ownership in underground water is so remarkably unfair, the contamination of water by adjacent operations is so difficult to prove, and the cost of litigation is so high, that fresh legislation certainly seems necessary.

The recommendations of the subcommittee may be summarised thus. The Ministry of Health should have power to schedule areas (after due notice and local inquiry) for protection. Inside those areas no fresh wells (except for domestic or farm purposes) and no fresh mine-shafts should be sunk without a permit from the Minister, who in mining cases would act in consultation with the Mines Department of the Board of Trade. To prevent pollution, all statutory water undertakings should be given the powers (which some already possess by local Act) of protecting their supplies by acquiring adjoining land, limiting its use, or requiring particular measures of drainage. Compensation would be given to interests injuriously affected. The Ministry of Health should have power to obtain returns of water pumped to waste. The borings of mining companies might be tubed and made water-tight. The specific strengthening of Sections 61 and 62 of the Waterworks Clauses Act of 1847 is recommended, and also (as already indicated) the general application of clauses now found only in local Acts, together with the comprehensive consolidation of the whole public law of water-supply. Some legislative action certainly appears essential. The problem of reconciling conflicting interests is not more difficult than that which Parliament managed to solve in the Mines (Working Facilities and Support) Act of 1923.

[1] H.M. Stationery Office. 1924. No. 112. 9*d*.

ORIENTAL SORE IN A NEW CENTRE IN PALESTINE.

IN the *Archiv für Schiffs- u. Tropen-Hygiene* for March Dr. A. Dostrowsky, of the Hadassah Medical Organisation in Jerusalem, tells us that Jericho is the only endemic area of Oriental sore (cutaneous leishmaniasis) so far known in Palestine, but reports that another has been found at Artuf, a small Jewish village of 114 inhabitants, 941 feet above the sea, on the other side of the Judæan hills from Jericho, with quite different flora, fauna, and physiography. It is two hours by train from Jerusalem. The resident doctor saw the first case in the summer of 1923, in a man who had not left the village for eight years. Altogether ten cases were seen, of all ages, and in only four families; in one family five children were attacked. How are such cases spread? Dr. Dostrowsky suggests it is by phlebotomi. The village had hardly known these flies till 1923, when, in the summer, they became a plague. The villagers live in two-storied houses, their cattle on the ground floor. That only four houses were infected is to be correlated

with the known habits of phlebotomi which gather, apparently without reason, in one house and leave the next alone; bugs and fleas distribute themselves more evenly. The sores are not spread by auto-infection through scratching, for even if the patient is lousy (many of them are very poor) and scratches freely, the later sores are, like the earlier, found only on the uncovered surfaces. The carrier, if any, of this outbreak cannot be traced; no stranger came to the valley in 1923. Cases are frequently seen in Jerusalem, but only in visitors; never has a patient who has returned to his home there been known to infect his relatives. Dr. Dostrowsky's view that Oriental sore is spread by an insect, most likely by a phlebotomus, has a good deal to support it.

INTERNATIONAL MEDICAL FELLOWSHIPS.

ONE of the most valuable gifts which an advanced scientific worker, whether at the bedside or in the laboratory, could hope to receive would be the opportunity of a period of intimate association with those engaged in studying similar problems in other countries. Until recently this privilege was hardly available except by private arrangement, but some three years ago the Rockefeller Foundation of New York allocated a fund of $50,000 to the Medical Research Council for the provision of Fellowships of Medicine tenable in the United States upon the award of the Council during a period of three years.

The Council, in giving public notice of these Rockefeller Medical Fellowships, announced their intention to award the Fellowships, in accordance with the desire of the Foundation, to graduates who had received training in research work in the primary sciences of medicine or in clinical medicine or surgery, and were likely to profit by a period of work at a university or other chosen centre in the United States before taking up positions for higher teaching or research in the United Kingdom. The first four Fellows appointed under the scheme worked in the United States during the academic year 1923–24. Dr. J. C. Bramwell was engaged in clinical and laboratory studies of diseases of the cardio-vascular system, chiefly with Prof. Erlanger at Washington University, St. Louis. Mr. N. M. Dott did clinical and experimental work in neurological surgery, with Prof. Harvey Cushing at the Peter Bent Brigham Hospital, Boston. Dr. Helen Ingleby worked with Dr. Adolph Meyer in the psychiatric clinic at the Johns Hopkins Hospital, Baltimore, on the morbid histology of the central nervous system. Dr. H. K. Ward was engaged in experimental work on the treatment of tuberculosis and on other subjects, chiefly with Dr. Zinsser in the Department of Bacteriology, Harvard Medical School, Boston. For the academic year 1924–25 Rockefeller Medical Fellowships were awarded to Mr. R. K. Cannan, Dr. J. J. Conybeare, Dr. J. R. Learmonth, Dr. Ethel M. Luce, Dr. J. W. McNee, and Dr. W. Robson. Full particulars and forms of application for Fellowships for the academic year 1925–26, which will shortly be awarded, are obtainable from the Secretary, Medical Research Council, 15, York-buildings, Adelphi, London, W.C. 2, with whom applications must be lodged before June 10th, 1925. Each Fellowship has the value of not less than £350 a year for a single Fellow, with extra allowance for a married Fellow, payable monthly in advance; the terms are elastic, so that special circumstances of individual candidates can be taken into account. Travelling expenses and some other allowances are made in addition.

The recent announcement that the Commonwealth Fund of New York has decided to establish 20 annual Fellowships at American universities for British graduate students is also welcome. The amount of these Fellowships will probably be about £600 a year for three years and the holders will be appointed by a committee of award. The student will be allowed to select the university in which he wishes to study, but not more than three Fellowships will be awarded at any one American university. Further details have not yet been announced, but since the members of the British Committee of Award include Sir Hugh Kerr Anderson, F.R.S., it is certain that the claims of medical graduates will receive a sympathetic hearing. These last-named Fellowships are largely made possible by donations amounting to over £5,000,000 from Mrs. Stephen K. Harkness to the Commonwealth Fund, towards the promotion of a closer understanding between Great Britain and the United States. It would be difficult to imagine a better way of achieving this object.

THE INFANTS HOSPITAL.

THE festival dinner of the Infants Hospital, Vincent-square, was held last week, by permission of the Corporation, in the Guildhall of London, under the presidency of H.R.H. Prince Henry, who made an excellent speech in proposing the prosperity of the institution. He pointed out that the hospital was the first of its kind to be established in Europe, and he appealed for the sum of £25,000, required for the further expansion of work whose objects included the placing on a scientific basis the management of infants up to 5 years of age, the treatment of nutritional diseases, and the investigation of the causes of infantile mortality. His Royal Highness stated correctly that some 40 per cent. of our infantile mortality is preventable, and amusingly concluded by pointing out, without intention, one of the main difficulties in connexion with prevention. He said that he had not known until he visited the Infants Hospital how complicated the feeding of infants is; but the general public, when for this reason or that the natural methods of sustenance fail, are in the same plight. Part of the work of the Infants Hospital is to spread knowledge. Mr. J. Gomer Berry, the chairman of the Hospital, spoke of the growing prosperity of the institution, of the attraction which it exercised for patients all over the country, and of the value of its researches, which were placed at the disposal of every doctor. He announced the gift from the Prudential Assurance Company of £1000 for the cost of an X ray installation, accompanied by a promise to maintain five beds. Lord Birkenhead proposed the medical and nursing staff of the Infants Hospital, and spoke of the movement which it represented as reflecting exactly the growth of our national responsibility for the physical welfare of the nation. Dr. Eric Pritchard, the medical director, having replied, it was announced that the donations had reached £15,000, about one-third of which sum was represented by the endowment of nine cots. We understand that a considerable further sum has since been received, so that the authorities of the Hospital can recognise that the stamp of public approval has been put upon their endeavours.

THE MEDICAL CAREER OF JOHN KEATS.

Sir William Hale-White, by his paper on the Medical Career of John Keats, delivered as the annual oration of the Medical Society of London on May 11th, added a valuable contribution to our knowledge and love of the man who is "numbered among the inheritors of unfulfilled renown with Catullus and Marlowe, with Chatterton and Shelley, whom we mourn as doubly dead in that they died so young" (Osler). Much has been written on Keats, but touching his career as a medical student surprisingly little, and that has often been wrong. Known to have been a surgical dresser, it is usually assumed that he was unqualified. But the medical profession has complete justification for regarding him as definitely one of us, and Sir William Hale-White exhibited on the epidiascope the actual pass list of the Society of Apothecaries as published in the "London Medical Repository," 1816, containing the entry: "John Keats, Wilston, Edmonton."

Keats was born in October, 1795, and in 1803 went to a school kept by John Clarke at Enfield. He left

school at the age of 16 to begin his apprenticeship to Mr. Thomas Hammond, surgeon, of 7, Church-street, Edmonton. Thomas Hammond's house, "Wilston," is at the present day named "St. Winifreds," and is still occupied by a medical man. Close by the house is a little cottage in which Keats and his fellow apprentice were housed, but this tiny building has recently been condemned, and will soon have disappeared. Keats was articled to Hammond for five years, but at the end of his fourth year he left to "walk the hospital" at Guy's, and his name is inscribed in the register of physicians' and surgeons' pupils and dressers in 1815. The notes which Keats took when attending lectures on anatomy and physiology have been preserved in a small grey-green notebook in boards with frayed edges at present in the Dilke Collection at the Hampstead Public Library. The orator showed on the screen a facsimile of that notebook, and he expressed his gratitude to the mayor of Hampstead for allowing him to have the facsimile made. Following the name "John Keats" on the inside cover are 28 pages of neat well-spaced notes on descriptive anatomy, notes which must obviously have been made at the writer's leisure. These notes occupy the left-hand pages, while the right-hand pages are filled with closely written, often misspelled records of physiology lectures, which sometimes run over into the margins of the anatomy notes. This contrast has led some authorities (as Sir Sidney Colvin) to say that Keats obtained some other student's anatomy notebook and used it for his own physiology notes, but Sir William Hale-White considered that all the writing came from the same hand, the varying circumstances of time and pen accounting for discrepancies. The anatomical notes were clearly made before the physiological ones, and surgical annotations are often added. The course in physiology as described in the notebook consisted of 12 lectures, the ninth of which Keats apparently did not attend, each on a separate subject. The lectures, Sir William Hale-White said, were good, up to date, and practical, each being illustrated by applications to medicine and surgery. Who was the lecturer? Keats does not name him, but six times in the anatomy lectures and 14 times in the physiological he refers to a "Mr. C." The *Medical and Physiological Journal* for the years 1814–15–16 gives the names of four lecturers in the combined schools of St. Thomas's and Guy's, all of whose names begin with "C"—Astley Cooper, Henry Cline, Curry, and Cholmedley. Curry and Cholmedley lectured on medicine alone, and can therefore be excluded, but both Cooper and Cline taught physiology. Cline's series of lectures, however, began with the muscles of the head, and as Keats's notes do not treat of these we may assume that the lecturer was not Cline, but Mr. (as he was then) Astley Cooper. And the evidence is strong that the anatomical notes were also derived from Astley Cooper. Sir William Hale-White, comparing some of Astley Cooper's lectures, published in 1824, with Keats's notes, found such similarities as follows: Astley Cooper—Koskiusco had his sciatic nerve wounded by a pike; Keats's notes—Patient K. had sciatic nerve wounded by a pike. The evidence is therefore conclusive that the whole of Keats's notes are from lectures by Astley Cooper. Lectures were a very important matter in those days, but the most dramatic part of the student's life was to attend operations, an unpleasant business. The orator quoted South's description of the scene in the operating theatre—the heat, the foulness, the screams of the wretched patient, and the struggle of students for front places when the operator was popular, as Astley Cooper was. Such scenes must have had a horrifying effect on the sensitive poet, and Astley Cooper, a true friend to his students, seems to have noticed Keats among the crowds who sat at his feet, and to have put him under the special care of his relation, George Cooper.

While attending Guy's Hospital, Keats at first lived alone in what was then 8, Dean-street in the Borough, since built over by the coming of the railway. On Astley Cooper's advice he went, in January, 1816, to lodge with Henry Stephens and George Wilson Mackereth in St. Thomas's-street. At this time he was much occupied with poetry, but he qualified, as has been said, in July, 1816. He had still seven or eight months of a dressership to complete, but there is not a line to show that he ever went back to hospital, and he certainly never became a practitioner. During his medical studentship the orator said there were two Keats in one body. The one was (as shown by his notes, by the rapidity with which he qualified, and by the ease with which he passed his examination) a diligent medical student, sufficiently outstanding to attract the attention of the great Astley Cooper; the other was the poet. He would sit so often in the window-seat of his lodgings in St. Thomas's-street that it was called Keats's place. The story was that here, dreamily resting one evening while Stephens was studying medicine, the young poet broke out with the announcement that he had composed a new line. "A thing of beauty is a constant joy," he recited, asking, "What think you of that, Stephens?" "It has the true ring, but is wanting in some way," said Stephens, and went on reading. An interval of silence, and then Keats broke out with, "A thing of beauty is a joy for ever"—and thus was born in St. Thomas's-street one of the imperishable lines of English poetry.

JAUNDICE IN THE GERMAN NAVY.

IN the March number of *Marine Rundschau*, a non-medical review dealing with naval interests, Marine Stabsarzt (Surgeon Lieut.-Commander) Dr. Heinrich Ruge gives an account of jaundice as a cause of invaliding in the German Navy. Between 1919 and 1923 he saw 1300 cases of jaundice, quite apart from cases of Weil's disease of which the exciting cause is definitely known. In these cases, commonly called "catarrhal"—although the term, according to Dr. Ruge, lacks pathological basis—the liver is usually enlarged, and may be tender. There is little risk to life, for only about one case in 900 is fatal, but great loss of service, inasmuch as cases are apt to be off duty for a month. Attacks often follow bouts of extra exertion, particularly when the places where work is done are badly ventilated, and for this reason, perhaps, bluejackets suffer less frequently than other men on board ship. An element of infection may be present, for of 19 officers who contracted jaundice 6 were medical officers, and the incidence on the sick-berth staff was also unduly high. The high prevalence of jaundice among the young recruits is ascribed by Dr. Ruge to impaired liver function dating from underfeeding during war-time. Dr. Ruge refers to the much-increased frequency of jaundice after salvarsan injections, which suggests to him that a liver, badly nourished as it was developing, is affected more seriously by both syphilis and salvarsan.

MANCHESTER'S SCHEME TO AID HOSPITALS.—A new movement on behalf of the voluntary hospitals is being started in Manchester with the object of bringing the appeal for funds home to many people whose pockets are hardly touched at present, for the Hospital Saturday and Hospital Sunday collections do little more than touch the fringe of the population. Divisional committees corresponding to the Parliamentary divisions are now being formed, and these committees are to work in turn through newly formed ward committees. Each ward is to aim at raising £2000 by inducing people who do not make a regular contribution to the hospitals to make a weekly, monthly, or annual contribution. Every kind of society in the different divisions—social, political, or artistic—will be appealed to help the committees to reach these untapped sources of income. The annual deficit of the Manchester hospitals is £50,000, and there is a waiting list of over 2000 patients. It is sought to obtain £70,000 annually to cover the annual deficit and to allow for new expenditure on buildings.

Modern Technique in Treatment.

A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.

CXXII.—THE TREATMENT OF TACHYCARDIA.

TACHYCARDIA may be due to a variety of causes, and is a condition which for two reasons may demand treatment. In the first place, rapid heart action, quite apart from any associated structural lesion, seriously impairs the efficiency of the circulatory mechanism. A heart which beats rapidly when the body is at rest lacks reserve power. It is severely handicapped when called upon to increase its output in response to an increased demand of the muscles for oxygen during physical activity.

And, secondly, tachycardia may make itself distressingly manifest to the sufferer in the form of palpitation. When this is so, he is continually being reminded that there is something the matter with his heart; and this aggravates his condition by adding to the other disabilities from which he is suffering an element of constant mental anxiety. Even in the absence of palpitation, tachycardia, discovered perhaps by accident, will afford a fertile source of worry to the introspective patient. He keeps feeling his pulse, and each time he does so the gruesome features of the bogey of heart disease loom more clearly before his eyes.

Differential Diagnosis.

In health the rhythmic stimuli which excite the heart to contract arise in a group of specialised cells situated in the wall of the right auricle and known as the "normal pacemaker" or the "sino-auricular node." In accordance with the functional activity of this pacemaker, every case of tachycardia may be classified in one of two groups: either (1) *the primary tachycardias*, in which the disturbing factor lies within the heart itself—in these the stable government of the sino-auricular node has been temporarily or permanently replaced by a revolutionary régime; or (2) the *secondary tachycardias*, in which the rapid action of the heart is a mere secondary manifestation, indirectly or reflexly produced, by a lesion, or by the effects of a lesion, in some other organ of the body. Here the stable government is still in power, but has been obliged temporarily to modify its policy in response to urgent pressure from outside.

Secondary Tachycardias.—There are two simple and extremely important criteria in the diagnosis of secondary tachycardia: (1) the heart's rhythm is regular, and (2) the heart rate is highly susceptible to variation in response to changes of posture or emotional disturbances. If the pulse exhibits these two features, and if there be no rheumatic history or other evidence suggestive of an organic lesion, in my opinion, tachycardia, *by itself alone*, never justifies a diagnosis of heart disease.

Most of the cases of rapid heart action which we meet with in practice are secondary tachycardias, and it is extremely important to realise that, in them, the heart is not primarily at fault; the mere fact that in such cases we can assure the patient that his heart is perfectly sound will prove to be a psycho-therapeutic factor of real value.

The treatment of cases in this group is essentially the treatment of the underlying condition, for with the elimination of the toxic or nervous factor which is bringing pressure to bear upon the heart the tachycardia automatically subsides. The simple tachycardia of Graves's disease, or of early pulmonary tuberculosis, that associated with various febrile conditions, or met with during convalescence from almost any acute illness, the tachycardia of neurasthenia, or that which occurs in perfectly healthy individuals as the result of some emotional disturbance, are all secondary tachycardias, and they are all generally easy to recognise.

In all types of secondary tachycardia, including "D.A.H.," any therapeutic measure which tends to direct the patient's attention to the heart is definitely harmful and should be most carefully avoided.

Primary Tachycardias.—In the treatment of the primary tachycardias, as in all forms of chronic heart disease, the restriction of physical exertion is of fundamental importance. The extent to which the patient is able and willing to adapt his mode of life to the limitations of his impaired cardiac reserve will largely determine the success or failure of any line of treatment. The diet should be such as will not cause flatulent distension of the stomach; the bowels should be carefully regulated, and excessive intake of fluid avoided.

As regards drug treatment, the practitioner has to decide whether he will strike at the root of the trouble and endeavour to restore the normal cardiac mechanism, or whether he would not do better to neglect the relatively unimportant auricle and concentrate upon the ventricle. He should ask himself three questions: (1) What chance is there of restoring the normal cardiac mechanism? (2) Is the normal mechanism, when restored, likely to be maintained? (3) To what extent is the patient likely to be benefited by the restoration of the normal mechanism?

Auricular Fibrillation.

The rapid heart action associated with auricular fibrillation is by far the most common of the "primary tachycardias." The features of this disorder, irregularity of the pulse both in rhythm and volume, numerous unproductive beats, which can be recognised by auscultation, but fail to reach the wrist, or even to open the aortic valves, and the commonly associated signs and symptoms of heart failure with venous congestion are characteristic and well recognised. In most cases the rapid ventricular rate is alone sufficient to account for the additional impairment in circulatory efficiency which accompanies the onset of fibrillation. It curtails diastole and thus hinders the filling of the ventricle, and it tires out the heart by frequent contractions, many of which are so premature that they serve no useful purpose. It is not surprising, therefore, that, without attempting to remedy the auricular mechanism, one can greatly improve the circulation by merely controlling the ventricular rate by means of digitalis.

The particular preparation selected is largely a matter of individual preference, but for general use either the tincture or the powdered leaf is eminently satisfactory. The larger dose of the infusion renders it less suitable when the drug is being given in large quantities, and the various proprietary preparations which I have tried appear to be less reliable in those cases of heart failure which demand immediate relief.

Recent work in pharmacology has shown that, in man, the absorption of digitalis from the alimentary canal is complete in six hours after administration, whereas the absorption of strophanthus from the alimentary canal is both poor and extremely variable. Full digitalisation can be rapidly obtained by the oral administration of massive doses. This procedure is perfectly safe provided the patient has not previously been taking digitalis or strophanthus, and provided that we allow an interval of six hours between successive doses. Morphine, gr. ¼, combined with the first dose of digitalis often brings great relief, by securing a few hours of much-needed sleep. The rate of elimination of digitalis from the body is such that, if necessary, a patient can take about 15 minims of the tincture per diem, over long periods of time, without any risk of cumulative effect.

The alternative plan of campaign is to attempt to restore the normal mechanism by means of quinidine, a procedure which requires careful supervision. In over 50 per cent. of cases of auricular fibrillation, normal rhythm can be restored temporarily by the use of quinidine, but it is only in a very much smaller number that the normal rhythm is permanent. When the symptoms are directly and mainly attributable to the presence

of an abnormal rhythm, the results of quinidine therapy may be highly satisfactory; but when the myocardium is severely and permanently damaged control of the ventricular rate, by means of digitalis, is likely to yield greater benefit to the patient than the restoration of the normal rhythm, which is often too rapid for the damaged heart.

The procedure which I usually adopt, first having got the patient fully digitalised, is to give an initial dose of 3 gr. of quinidine, either as a powder or in the form of a cachet, and then, after waiting 12 hours to guard against the possibility of any idiosyncrasy to the drug, I give 6 gr. every three hours for five doses, and if necessary repeat this procedure on the two succeeding days. My own personal experience suggests that, if the normal mechanism is not restored before the end of the third day, although it often may be restored later by prolonging the treatment, it is not likely to be permanent. Quinidine tends to increase the ventricular rate, and digitalis may be given simultaneously to counteract this action. Quinidine is withheld if the heart rate becomes excessive, and is discontinued as soon as the rhythm becomes regular or toxic symptoms supervene.

Auricular Flutter.

In auricular flutter the pulse is generally regular, and in the neighbourhood of 150 per minute, while the auricle is beating at double that rate, every second auricular impulse failing to reach the ventricle. The degree of block between auricle and ventricle can be increased by digitalis, and the ventricular rate satisfactorily controlled in this way. By pushing the digitalis treatment, flutter can be converted into fibrillation; and then, if the drug be discontinued, in some cases the fibrillation will be replaced by normal rhythm. Flutter may persist for many years; but, provided the ventricular rate be efficiently controlled by digitalis, this disorder appears to impose surprisingly little additional burden on the heart.

Paroxysmal Tachycardia.

In true paroxysmal tachycardia the attacks commence and terminate absolutely abruptly, and for no apparent cause; the heart without warning suddenly switching over, in a single cycle, from the normal to an extraordinarily rapid rate of beating, often in the neighbourhood of 200 per minute. In any condition such as this, where the attacks are liable to occur at irregular intervals and to terminate spontaneously, it is exceedingly difficult, if not impossible, to assess the true value of the therapeutic agents which we have employed. Various methods of aborting the attacks have been advocated by different physicians, but none has proved infallible; and one is bound to admit that, at the present time, we know of no really reliable method of combating this disorder. Sometimes vagal stimulation, either direct, by pressure in the neck, or reflex, by the induction of vomiting or forced deep respiration, will abort an attack, but more frequently such methods fail, and we have to be content with endeavouring to prevent the attacks by carefully eliminating any infective, toxic, or nervous exciting factor.

Before becoming permanently established, auricular fibrillation is liable to occur in paroxysms which alternate with periods of normal rhythm. Although it may hardly seem justifiable to draw any conclusions as to the results of treatment in such paroxysmal attacks, quinidine does appear to yield good results.

Structural cardiac lesions are generally permanent, but derangements of function are often extremely amenable to treatment; by appropriate management and drug therapy we can do much to restore balance, to relieve symptoms, and to enable the heart, even when badly damaged, to carry on its functions in a fairly satisfactory way for long periods of time.

J. CRIGHTON BRAMWELL, M.D. Manch., M.R.C.P. Lond.,
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Special Articles.

PROCEEDINGS OF THE ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.*

(*Continued from p. 995.*)

EVIDENCE OF THE BRITISH DENTAL ASSOCIATION.

(App. XIX.) The British Dental Association submitted evidence on the dental treatment at present available, the need for the extension of dental treatment and for its establishment as a permanent statutory benefit, and the scope of such a permanent service.

The evidence was given by Mr. J. H. Badcock, President-elect, Mr. E. Y. Richardson, and Mr. B. J. Wood.

Early Recognition of the Need for a Public Dental Service.

Organised schemes of dental aid for persons who could not afford private dental fees were not unknown prior to the Insurance Act. Following upon the passing of the Act of 1911, and independently of State support or recognition, a scheme for a Public Dental Service to be available for all persons coming under the age-limit of the National Health Insurance Act was drawn up and preparations were made for making dental treatment available under it in all parts of the country. The outbreak of the war prevented the realisation of this project, but it was revived after the 1918 valuations of Approved Societies, which set free surplus funds available for additional benefits, amongst which was included dental benefit.

Panels of Dentists.

The British Dental Association took the initiative in calling meetings throughout the country which every registered dentist was invited to attend, with the object of organising panels of dentists who would undertake to treat insured persons.

(App. XIX., 4–7. Q. 9212.) Up to the passing of the Act of 1921 the British Dental Association represented from three-fifths to two-thirds of the practising members of the profession. It has not so far admitted to its membership the "1921" dentists. When the panels were formed they soon felt the need for coöperation and for uniformity of action and control, and in December, 1922, combined to form themselves into the Public Dental Service Association of Great Britain, Limited. This Association numbers nearly 7000 members.

Criticisms of the Present System.

(App. XIX., 10–14. Q. 9228–9.) The present system was criticised by the witnesses on account of the unequal distribution of the benefits, the different

* In previous articles the proceedings of the Commission were reported under the following headings: Introductory Note; The Scope of the Insurance Scheme (see THE LANCET, Jan. 31st, pp. 247–8); The Provision of Medical Benefit (Feb. 7th, pp. 301–3; Feb. 14th, pp. 355–8; Feb. 21st, pp. 403–5); Financial Provisions of the Act (Feb. 28th, pp. 454–7); Medical Certification and the Regional Medical Staff (March 7th, pp. 508–9); The Approved Societies and the Money Benefits (March 14th, pp. 564–5; March 21st, pp. 623–4); Evidence of the Hearts of Oak Society (March 28th, pp. 677–9); Evidence of the National Conference of Industrial Assurance Approved Societies and of the Manchester Unity Approved Society (April 4th, pp. 731–3); Evidence of Independent Order of Rechabites, of Rational Association Friendly Society, and of Miners' Societies (April 11th, pp. 784–6; April 18th, p. 839); Evidence of Mr. Alban Gordon (April 18th, pp. 839–40); Evidence of Joint Committee of Approved Societies, of Stock Exchange and Lloyds' Health Insurance Societies, and of Group of Catholic Approved Societies (April 25th, pp. 889–91); Evidence of the National Insurance Beneficent Society (May 2nd, pp. 943–4); Evidence of the British Medical Association (May 9th, pp. 993–5).

References to the paragraphs in the printed statements issued as appendices to the reports of the oral evidence are given thus: "App. X. 69," and references to the oral evidence thus—Q. 1369.

proportions of payment met by the societies, and the fact that each dentist has to deal with a great number of different societies.

If the individual dentist had to deal with one body, say the local insurance committee, for the whole number of his cases instead of having to deal with 300 or 400 societies as at present, all slightly differing, it would enormously lighten his burden of correspondence and would lead to greater efficiency in many other ways.

It was also suggested by the witnesses that although in some cases emergency treatment is definitely provided for in the arrangements, some societies, when a claim has been made, have repudiated it on the ground that a "dental letter" had not been completed. Even among members of the same society there is inequality of treatment owing to the fact that where the patient is unable himself to find a portion of the dentist's fee he has usually to decide to go without the treatment.

The statement sometimes made that about 7 millions of insured persons are entitled to dental treatment creates quite an erroneous impression. As already stated, so many members have to give up their claim to benefit because they are unable to pay. Further—

Adolescents joining societies which give dental treatment as additional benefit are not eligible for such treatment when they join, but must wait a variable number of years before they become entitled to the benefit, thus losing the advantage of dental treatment at the very age when it is most needed and would do the greatest amount of good.

Perhaps the best that can be said about the present service is that—

It has afforded opportunity for the experimental testing of a means of supplying dental treatment and has demonstrated that the members of Approved Societies are eager to take advantage of such facilities for dental treatment as have so far been provided.

The Need for an Extensive Scheme.

(App. XIX., 24–35.) Reports of Departmental Committees and of various authorities are quoted in an appendix to this evidence, and it is suggested that they prove up to the hilt the case for a wide extension of public dental service. Any campaign against national disease which neglects this, one of the chief outposts of preventive medicine, is making a tragic error. Also, the evidence states—

Employers of labour who have established dental clinics for their workpeople are unanimous in testifying that, philanthropy apart, the treatment pays in increased efficiency of the worker and diminished loss of working hours through indisposition.

A Complete Service.

(App. XIX., 32–8.) The remedy for the present unsatisfactory provision is not an extension of additional benefit, but a complete scheme which would include:—

(1) Dental treatment at maternity and child welfare centres; (2) treatment during school age; (3) treatment for adults and their dependants under an insurance scheme.

Such a scheme should embrace:—

The extraction of teeth under local or general anæsthetics. The scaling of teeth and the treatment of inflammatory conditions of the mouth. The filling of cavities in carious teeth. The provision and repair of partial and complete artificial dentures.

(App. XIX., 42.) The most urgent necessity is a complete school dental service staffed and organised so that every school child during its entire school age has dental treatment of a preventive and curative nature. This service should be linked to, and should follow on, an equally complete scheme of dental treatment for children under school age and for expectant and nursing mothers.

Until these services are effectively organised, adult dental treatment of the industrial classes must remain chiefly a matter of extraction of septic teeth and the insertion of dentures, which is a perversion of the highest requirements of public health and an outrage on common sense.

Medical Benefit Machinery Recommended.

(Q. 9220–30.) The witnesses suggested that the service for a statutory dental benefit should be controlled as regards the local arrangements by the Insurance Committee in the same way that medical benefit is at present administered; that there should be a dental panel committee, a dental service subcommittee (for dealing with complaints), and regional dental officers.

The Cost of the Service.

(Q. 9245–6.) Careful analysis of various figures have resulted in the Association putting forward the suggestion that 5*s.* per head of the insured population is the best approximation that can be made at the present time of the cost of a complete service. The witnesses said, however, that the actual payment of the dentists by means of a capitation fee was not practicable. (Q. 9320.) Abuses under a system of payment for services might be checked by the proposed regional officers.

(Q. 9456–61.) On a 5*s.* basis it was pointed out to the witnesses that this would put roughly £500 a year into the pockets of every one of the 7500 dentists taking part in the scheme. The reply was that this would by no means represent all new income to the dentists, and that, in any case, the numbers would be nearer 10,000 than 7500.

An Adequate Supply of Dentists—and the Demand.

(Q. 9125–8, 9385.) The witnesses said that an adequate number of registered dentists would be forthcoming to run a satisfactory service for the whole insured population. A complete scheme could almost certainly not come into full being all at once, and as it grew the dental profession could be relied upon to meet the increasing demands.

(Q. 9230.) The average demand-rate was thought to be about 5 per cent., which gives 750,000 cases a year for an insured population of 15 millions.

Clinic v. *Panel.*

(App. XIX., 19–23.) The panel system was advocated as being readily adaptable to meet small or large demands and as facilitating free choice of dentist. The clinic system permits of the effective handling of large numbers where a continuous supply of patients is assured.

(Q. 9241–2, 9254, 9406–12.) The dental profession, in any case, would object to clinics with whole-time salaried officers controlled by Approved Societies; they would not object to clinics organised by the dentists themselves or of arrangements made under which part-time dentists were paid a fee per session. Such clinics would permit of specialised treatment—X rays, violet rays, and ionisation—not always available in a private surgery. It appeared that in objecting to lay control the witnesses were visualising the possibility of interference with the professional treatment of a patient. They said they would not mind in the least control which was confined to administration and questions of discipline, provided that there was some dental representation on the governing body.

EVIDENCE OF OTHER DENTAL ORGANISATIONS.

British Society of Dental Surgeons.

(App. XX. Q. 9462–9626.) The evidence for this society was given by Sir Frank Colyer and Dr. E. W. Fish. They emphasised the importance of a national scheme for the prevention of dental disease and urged that prophylactic measures should have the first consideration. It was of great importance that the dependants of the insured should be included as soon as funds were available. In the meantime they made recommendations for an immediate scheme of treatment for the insured estimated to cost 3*s.* 6*d.* per head, and limited at present to (*a*) propaganda, (*b*) extraction of tender or hopelessly infected teeth under suitable anæsthetics; and (*c*) scaling of the remainder. As regards administration, the formation of panels of dentists was suggested and generally the same machinery as for medical benefit. For the administration of general anæsthetics an addition to the medical capitation fee would be necessary.

A Clean Mouth More Important than Dentures.

The witnesses suggested (Q. 9498) that any insurance scheme should be limited to extractions and fillings, and that if patients wanted dentures they should provide them out of their own pockets. The provision of dentures was, it was suggested, not at all an essential to health, but was largely for matters of appearance. The "1921" dentists were far too prone to extract teeth and put in dentures, and generally the witnesses thought that there was room for propaganda amongst the dentists themselves as to the importance of preventive treatment and the preservation of the clean mouth rather than remedial treatment.

Public Dental Service Organisation.

(App. XXII. Q. 9787–10,060.) This evidence was given by Mr. J. Clifford Wing, the Chairman, and Colonel Howkins, Mr. A. H. Condry, and Mr. P. I. Wigoder. This association came into existence as a direct result of the demand for dental benefit out of the surplus funds of Approved Societies. It contains 7000 members and embraces the great majority of Insurance dental practitioners. The witnesses were whole-heartedly in favour of a large extension of dental treatment under the Health Insurance scheme and said that their cordial coöperation would be forthcoming. The cost of the provision of public dental treatment would, they suggested, be largely off-set by a reduction in the quantity of medical treatment needed.

They endorsed the earlier evidence as to the lack of uniformity in the present system of administration by various Approved Societies, as to the objections to clinics, and agreed that there would be an adequate supply of dentists forthcoming for a national scheme.

Linking-up Provisions.—They urged that any scheme of dental benefit would be defective which was not linked up with the existing provisions for the treatment of dental disease among children and which left any gap in the supervision and treatment of dental disease between childhood and maturity.

Scope and Cost of a National Service.—The witnesses suggested that professional opinion would be found almost unanimous in approval of the following schedule: Carefully organised propaganda as to the care of teeth, with a view to the prevention of dental caries and other disease; scaling of teeth and treatment of inflammatory conditions of gums; fillings; extraction of teeth under (1) local, (2) general anæsthetics; provision of (1) complete, and (2) partial artificial dentures. The cost on such figures as were available would be met by 1*d.* a week per insured person, but it was thought that this might be found to be an under-estimate. The witnesses indicated the order of precedence for these services (Q. 9829): (1) Extraction of teeth, (2) scaling and filling, and (3) the provision of dentures. Propaganda should, they thought, be carried out by the Dental Board. They disagreed entirely (Q. 9882) with the suggestion which had been made that it was not necessary for the health of an adult that he should have his bad teeth replaced by dentures.

Cost and the Safeguarding of the Funds.—The witnesses handed in the scale of charges agreed with the Approved Societies, which is a lengthy document and includes amongst other items: extractions with local anæsthetic 2*s.* 6*d.* a tooth up to three, and a maximum fee for upper and lower jaws of £1. For a full denture, upper and lower plates, including any necessary extractions, £6 10*s.* is paid. The capitation fee of 1*d.* per week per insured person suggested above was based, it appeared, upon the cost to an Approved Society under a scheme where the members themselves had to pay a part. The risk of an indefinite charge under a national scheme where the dentist was paid for each service rendered might be safeguarded: (1) by the fact that dentists were honourable men; (2) by the unpopularity of dental treatment; and (3) by the appointment of regional dental officers. Medical certificates were quite unnecessary (Q. 9949). "Medical men do not understand anything about dental conditions." Subject to the supervision by the Regional Dental Staff, the witnesses thought that the bills for treatment would have to be met in full, and that if there was not enough money to meet them the State ought to find the balance.

The Incorporated Dental Society.

(App. XXVIII. Q. 11202–11392.) This society, for whom evidence was given by Mr. W. F. Bower and Mr. Butterfield, contains about one-third of the 7000 "1921" dentists. The objections already urged by other witnesses to the present partial scheme and the varying standards of administration were reiterated. A great deal of the evidence was taken up with the objection felt to clinics as being "contrary to the psychology of the average insured person" and also bad professionally. The witnesses suggested inter alia that the dental benefit must be adequate and free of cost to the patient, and that there must be free choice of dentist. There was a sufficient number of dentists to give complete treatment and to overtake arrears.

The suggested cost was 1½*d.* per week per head of the insured population, and the dentists undertaking service would certainly object to any scaling-down of their bills.

ROYAL COMMISSION ON LUNACY AND MENTAL DISORDER.

FURTHER SITTINGS.

(*Continued from p. 889.*)

THE Commission held a further session on May 4th and 5th, Mr. H. P. Macmillan, K.C., the Chairman of the Commission, presiding.

EVIDENCE OF THE MEDICO-PSYCHOLOGICAL ASSOCIATION.

The two days were occupied by the evidence tendered by the Medico-Psychological Association of Great Britain and Ireland. That body was represented by Dr. R. H. Cole (chairman of the committee appointed in July, 1924, to prepare a précis of evidence), Sir Frederick Mott, F.R.S., Lieut.-Colonel E. Goodall, Lieut.-Colonel J. R. Lord, Dr. W. F. Menzies, Dr. R. Worth, and Dr. M. Abdy Collins.

The evidence set out that the Association was established in 1841, and its objects were to facilitate intercommunication on all matters concerning the care, treatment, and recovery of patients suffering from mental disorder, and the collaboration of research into and the elucidation of the causes of insanity and its prevention. It was now some 800 strong, and a large proportion of the members were medical superintendents or medical officers of mental institutions. Since 1892, 379 medical men had been awarded its certificate in psychological medicine, while 18,000 certificates in mental nursing had been granted by it.

In regard to the general aspect of the subject the committee state that the need for legislative action before certain progressive lines could be followed had militated against the real advance which those engaged in this work desired.

In 1911 a committee was appointed by the Association to inquire into the status of British psychiatry, and it reported grave defects under which the specialty in this country laboured. Two of the chief of these were (1) the absence of proper provision for the early treatment of incipient and undeveloped cases of mental disorder; (2) the paucity of facilities for the study of psychiatry and for research. This committee recommended the establishment of clinics for mental disorders in connexion with universities, medical schools, and general hospitals; also that, as a general principle, the admission to all mental institutions should be on a voluntary basis, and loss

of civil rights should not be consequential thereto. A further recommendation was that incipient cases should be detainable for a limited period, such cases being notified to the Board of Control; and that admissions to mental institutions should have no relation to poor-law authorities. They also asked that the use of urgency or provisional orders should be widened.

It was the view of the Association that the vast majority of the community, patients included, was grateful for the protection given by the present Lunacy Acts, and that on the whole the safeguards they provided against abuses and illegal detention had proved satisfactory. These Acts had failed, however, to keep pace with medical progress, especially in regard to the treatment of initial and more curable stages.

The Association state that many medical practitioners, not having had means of learning the manifestations and treatment of early mental disorders, failed to recognise the seriousness of them and the need for efficient treatment. Many such patients belonging to the well-to-do classes, who were certifiable, were now in private houses and nursing homes without any order having been obtained for their reception, and no intimation of such admission had been given to the Board of Control. There should be opportunities for the competent authority to ascertain that these places were suitable for the purpose.

The evidence tendered by the Association included appendices by Sir Frederick Mott (on better provision for early treatment), by Lieut.-Colonel Goodall (on a cognate subject), and by Lieut.-Colonel Lord (on psychiatry in some European countries and in America).

The Association's Recommendations.

The recommendations of the Association number no less than 57. The following are some of the points:—

In the organisation of clinics, special provision should be made for children, and the clinics should be, where possible, annexed to a general hospital or housed in a special building. Their medical and nursing staffs should include those specially trained in psychiatric work. Local authorities should provide and maintain these clinics or avail themselves of voluntary organisations for the purpose. Inspection and approval of the buildings so used should devolve upon a central Government department. In the case of voluntary patients, a 72-hour notice in writing should be required if a patient wished to leave the institution. The central Government department should have power to approve homes which were supported, wholly or in part, by voluntary contributions, or which were privately owned, which could lawfully receive without certification more than one paying patient who was suffering from early mental disease. All matters of mental health should be centralised in the Board of Control, which the Association preferred should be known as the Board of Mental Health, and that it should have a larger staff. When appointments were made as Medical Commissioners of the Board of Mental Health, consideration should be paid not only to the candidate's experience in mental disorders, but also to status and experience in the medical profession as a whole. The management of all rate-supported institutions for the care and treatment of mental disorders should be vested in one statutory committee of mental health of a local authority; the county or borough rate should be utilised to support the maintenance of necessitous patients, as well as of the fabric of public mental institutions, the rate being supplemented by a Government grant. A further recommendation was that the words "lunacy" and "lunatics" should be replaced by "mental disorders" and "persons of unsound mind"; and "asylum" by "mental hospital"; also that two medical certificates should be required for rate-aided as well as for private patients. The committee considered that there was need of simplification of forms under the existing Lunacy Acts, and that leave of absence on trial or for health should be encouraged. They further thought that the automatic discharge of a patient by escape after 14 days was undesirable. The after-care of rate-aided patients should be considered, and the work of such bodies as the Mental After-Care Association should receive adequate pecuniary recognition by statutory committees. Patients alleged to be of unsound mind should not be removed to a workhouse infirmary before their reception at a mental hospital. Patients transferred from a mental hospital to a poor-law institution should be transferable back again without re-certification. Reports on mental cases in all Poor-law institutions should be notified to the Board of Mental Health, and better provision should be made for the care and treatment of senile cases in infirmaries approved by the Board of Mental Health. The committee's final recommendation was that the protection afforded to medical practitioners by Section 330 of the Lunacy Act, 1890, should be extended so as to stay proceedings at an earlier stage than at present, and that they should receive the same immunity as that granted to witnesses in a court of law.

Colonel Goodall, in his special appendix, says that the Lunacy Acts of England and Wales mainly concerned themselves with the segregation and care of the "lunatic," the protection of him and his property, and of the public, and a perusal of the Acts left the impression that merely an alien was being dealt with, not a sick man. He also says that, apart from the Maudsley Hospital, we in England and Wales had long been merely marking time in psychiatry.

The Chairman put a number of questions as to the work done by the Association in improving mental nursing, and the provisions of the new General Nursing Council. Dr. Collins said the Association proposed to continue to hold its examinations for nurses. Dr. Cole said it was felt by the members that an unnecessary amount of records were required to be kept. This was such a burden that it really interfered with the treatment of mental disorder. As to the safeguards of the present statutes, these, except in certain minor respects, could not be improved upon.

Voluntary Treatment.

With regard to treatment of the early stages of the disorder, Colonel Goodall said the Association had pressed for some time for a relaxation of the law in this direction. The mental clinic should be under the same administration as the general hospital. He did not think it was wise to have mental patients in general wards. He thought all kinds of early cases should be admissible to the clinic; here the treatment would be more intensive than in an ordinary asylum: there would be a larger proportion of staff, and the latter would be assisted by other medical men. He disliked the idea that these clinics would be corridors to the asylums.

The question of voluntary patients was discussed in a conversational way round the table, views being freely exchanged. Dr. Menzies drew attention to the class of case already certified and in a mental hospital who became physically ill and needed surgical or other special treatment, such as a general hospital was continually giving. These could be transferred to the general hospital clinic for a period.

Stigma.

Dr. Menzies expressed the view that the stigma which was generally held to attach to mental disease would be greatly diminished with the spread of education and enlightenment. A large part of the objection to being certified was found to consist in the fact that patients who had been discharged from a mental hospital were proved by experience to be unemployable, however well they might be deemed to have recovered. The statement was often made: "He may have a relapse at any time: he might have one now."

Sir Ernest Hiley suggested that if a man mentally ill were removed by the sanitary inspector he would

probably be stigmatised, and Dr. Collins asked why the same person should not do this as acted in the cases of scarlet fever. Dr. Cole said many voluntary patients themselves told their friends that the place they had been to was really an asylum. Still, a man who went to an ordinary hospital would be regarded as less mentally ill than if he were to go to the Maudsley Hospital. Sir Ernest Hiley said that even a special ward for these cases in a general hospital was known as "The Balmy Ward," and Colonel Goodall retorted that that was no reason why people should be denied the benefits attaching to such a ward.

Classification.

Sir Frederick Mott said it was desirable to have, in association with mental hospitals, what was known as an "acute block" outside the mental hospital grounds so that patients here would not mix with chronic lunatics at all. Many mental hospitals were without this provision. These would be for the more curable cases and would be useful as clinics to which general practitioners could bring their patients. Dr. Cole said that, wherever possible, mental clinics should be in association with general hospitals. In answer to the Chairman, he said that rate-aided and the private patient should be assimilated in the matter of legal procedure. There should be no distinction simply because one had money. The two medical certificates recommended for each class of patient could be given after consultation, but there should be a separate examination of the patient by each of the medical signatories. Colonel Lord said it had been felt all along that the Poor-law officials were not the right people to have charge of the insane. The Association considered that the county council or the borough council should not only build and maintain mental hospitals, but that they should take over all the duties and responsibilities in connexion with those patients. That would be better for the patients, better for the administration, and would probably be, in the long run, more economical.

The Patient's Rights.

Dr. Menzies, in answer to a question by the Chairman, said that the justices acting in this work should be specially chosen—perhaps by their brother magistrates—by reason of their experience and interest in lunacy work. With regard to the right of a patient to see a magistrate, Dr. Cole said the exercise of this right was sometimes very upsetting to patients, especially as the form to be filled up was such an elaborate one. Dr. Menzies said the fundamental principle of all the Association's recommendations was to render the treatment of the patient as a sick man as easy as possible, and to make improper detention as difficult as possible.

Lord Russell asked in how many cases a second certificate would prevent a man being wrongfully detained, and Dr. Menzies replied that in ten years' time it was hoped that the permanent certificates would be reduced to a fourth of the present number.

Sir David Drummond asked whether the Association's view was that the second certificate should be given by an expert in these diseases, and Dr. Cole replied that it was felt that the right of supplying the second certificate should not be taken from medical men as a whole; but they felt that every medical man should have some proficiency in mental diseases.

The Central Authority.

Dr. Menzies was questioned upon a supplementary memorandum which he had supplied, chiefly on the question of the central authority. He said his view was that the paid Commissioners should consist of five medical men and two legal members. The medical members should be paid at least £2000 per annum, and years served under a local authority should be taken into account in determining the pension. At present questions were kept held up at the Board of Control two or three weeks. He also suggested that there should be district inspectors. The feeling of the Association was that the gentlemen so appointed should be high experts, men of the highest medical and scientific attainment. He mentioned the late Sir Clifford Allbutt as the type of man the Association had in mind.

Licensed Houses.

Dr. Cole said it was felt that when the Act of 1890 came into force, the stoppage of the extension of licensed houses due to it was a mistake. The general public wanted their relatives who were mentally ill to go to a place they themselves selected. A considerable proportion of people and doctors preferred the licensed house. When those houses were full there was a tendency to evade the Lunacy Act, to keep in houses patients who ought to be certified to the Board of Control but were not. The present distribution of licensed houses was very unequal. By interfering with private asylums one was interfering with private single patients and with private practice, considered as a whole.

Asked as to possible collusion in these houses, Dr. Cole said the only collusion he could think of was between a medical officer and a relative of a patient. He felt sure there was no risk of exploitation of patients.

Lord Russell suggested there might be a temptation to extend the time of detention of a patient beyond the needed period, but Dr. Cole said he did not think that was so; people did not pay more for the care of their relatives in these circumstances than they could help. Some preferred to remain on as voluntary boarders, and there seemed no good reason why they should not. Lord Russell explained that the real point was the suspicion of the public that on occasion interest might conflict with duty.

Female Nurses in Male Wards.

Colonel Goodall was questioned about his experiences in having male wards nursed by women. He said his individual view was favourable to this—the Association as a whole had not pronounced on the matter. Six of his wards were under female nurses, and in two of them there were no men at all. That had been the case in his mental hospital since 1920. In three war years he had great experience in the treatment of mental cases, some of them very severe, and these were under the care of trained female mental nurses, some men being, during the war, employed in a subordinate capacity. Women, he found, were able to exercise sufficient control over these male patients, except in the small matter of exercising in the gardens. From the therapeutic standpoint he was sure women were far superior to men for the work; there was a psychological and sex basis for this. This employment of women nurses in male wards had been attacked by the local trades-unions, on the moral ground, and that of the alleged unnecessary supplanting of the men. Both these objections were false, and he had not discharged a man so that a woman could be appointed.

Psychiatric Education and Research.

At the short sitting on Tuesday the chair was occupied during part of the time by Mr. Micklem, K.C.

Sir Frederick Mott spoke of the need for better provision for education and research in connexion with mental disorder. In 1907 he felt convinced that the diploma in psychological medicine would be of equal value to the D.P.H. Now, in L.C.C. mental hospitals the possession of this diploma was a sine qua non for a senior appointment. It was granted only to men who had been a year or two in asylums. There were at present only three holders of the London University doctorate in psychological medicine. He outlined a plan whereby, for purposes of research, several asylums would have a central laboratory, apart from the laboratory of each. Colonel Goodall said that at Cardiff large sums of money had already been spent on research. The present teaching on psychiatry was inadequate in this country, far worse than at Utrecht University, for instance. Sir Frederick Mott argued in favour of team-work which had brought about advances which no individual work could have done.

MEDICINE AND THE LAW.

SALE OF MILK "AS IT CAME FROM THE COW."

AN appeal was heard recently in the Divisional Court in which J. Bridges, an inspector under the Sale of Food and Drugs Act, appealed against a decision of the justices at Stow-on-the-Wold dismissing a summons that he had taken out against J. Griffin, a dairyman. The appellant had bought from a roundsman employed by the respondent a pint of milk, which on analysis had been found to be deficient to the extent of 46 per cent. in milk-fat. The milk had been drawn from a tap at the bottom of a churn. The respondent had given evidence of having instructed his man to stir the milk before drawing it off for a customer; but whether this had been done or not the magistrates had been satisfied that the milk was put into the churn in the state in which it came from the cow, and that no one had had access to the churn or had tampered with its contents. The question argued, therefore, was in substance whether an "abstraction" of cream, within the meaning of the Milk Regulations, 1901, takes place if milk has been drawn from the bottom of a churn, when some of the cream which should go to the customer has risen to the top. The summons was for selling milk not of the nature, substance, and quality demanded by the purchaser, not for actually abstracting the cream, the Milk Regulations, as was argued on behalf of the respondent, establishing no standard for what should constitute milk, but providing only that if it has failed to reach a certain standard adulteration by addition of water or abstraction of fat should be presumed. It was contended that where the analyst's certificate only was relied upon by the prosecution, proof that the milk was put in the churn as it left the cow and had not been tampered with was a good defence.

The Lord Chief Justice gave judgment allowing the appeal, in which Mr. Justice Avory and Mr. Justice Shearman concurred. Lord Hewart said that the case had resolved itself into a question whether there could be said to be abstraction of milk-fat where all that had happened was that the milk had been poured in bulk into a receptacle and, after the cream had risen, had been sold as new milk, when owing to the construction of the receptacle it had been drawn from the bottom. The regulations did not supply a definition of milk, but supplied a means of proof. The milk, however, to which the regulation referred was not the milk in bulk in the churn, but the actual sample sold to the customer. In *Hunt* v. *Richardson* [(1916) 2 K.B. 446] it had been found expressly that nothing had been subtracted or added, and the defence that the milk was "as it came from the cow" had been adopted ever since. The important moment was, however, the moment of sale, and the important milk was the milk that was sold. It was not enough to say that there was a time when it formed part of milk which was in its natural state. The milk as put in the churn was found by the magistrates to have been in its natural state. There was no finding that the sample sold was in that condition, and it was contended that the cream had risen to the top owing to the churn having been allowed to stand. In *Dyke* v. *Gower* [(1892) 1 Q. B. 220] cream had been abstracted from milk at the bottom of a receptacle because milk had been taken up from the top by means of a dipper; this was the reverse of what had happened in the case under discussion. His Lordship asked whether if a seller put milk into a receptacle knowing that the cream would rise to the top, and then sold from the bottom, he could say that milk so denuded of cream was as it came from the cow. In *Dyke* v. *Gower* the abstraction of cream had been ascribed to "neglect to keep the milk stirred." His Lordship referred to Scottish cases which appeared to harmonise with the reasoning in *Dyke* v. *Gower*. There was nothing in the case before the Court on which the magistrates could find that the milk was in the condition in which it came from the cow, and the right conclusion was that it was not of the nature, substance, and quality of that which was asked for. There was also evidence that the defendant knew what would happen if the milk was not stirred, but no evidence to show that to stir it would be impracticable. The appeal, therefore, ought to be allowed.

The successful appellant in this case is to be congratulated, as does the local authority for which he acted, upon having secured a decision which will be of great value to others having like responsibility for maintaining the quality of milk sold throughout the country. The importance of Lord Hewart's judgment lies in the attention which it calls to the essential question of the condition of the milk actually sold, and to its condition at the time of sale. This, of course, is what really concerns the customer and consumer. A housewife who buys milk deficient in cream can derive no consolation from the possible fact that it once formed part of a larger quantity of milk which was rich in cream, or from the fact that no deliberate or mechanical abstraction of cream from it has taken place. It is also clear that the decision inflicts no hardship on the great majority of honest milk-dealers, who only wish to supply good milk, and who know that they can put it in bottles and sell it in them as it came from the cow, or can see that their men keep it stirred with a plunger when on their rounds. The plunger, however, should be so fitted that it can be used without exposing the milk to any external contamination. Of this also milk-dealers are well aware.

BAKER'S ITCH AND WORKMEN'S COMPENSATION.

In a paper read before the Royal Society of Medicine, Section of Dermatology, in October, 1924,[1] on the subject of "baker's eczema," Dr. Prosser White and those who joined in the subsequent discussion showed that there is by no means unanimous medical opinion as to the causes of the symptoms complained of by workmen who seek compensation for this affection. Dr. White indeed suggested serious doubt as to whether the claimants of such compensation had a primary morbid condition of the skin, and whether there was in fact any rash peculiar to those who prepare bread and confectionery for human consumption. In an interesting compensation case heard recently at Hanley, and briefly reported in our last issue, his honour Judge Ruegg had before him a workman fully recovered, who had suffered from the complaint and anticipated its recurrence if he returned to his work. The judge held that to compensate a man for that from which he was not suffering would be to compensate him for life, and that if the man returned to baking and developed the disease again he could claim compensation as for a fresh accident. It was intimated, however, that there would be an appeal, which will be awaited with interest by bakers and confectioners. In view of the opinions expressed at the meeting of the Royal Society of Medicine it would be interesting from a medical point of view to know whether on such occasions as the above the evidence proves that the workman's illness is directly and exclusively due to his occupation. If there is a predisposition to eczema it would hardly seem fair that a man should be compensated permanently, merely because he has developed it through engaging in work likely to have that effect, and another form of livelihood would seem to be indicated. If, on the other hand, the making of bread and confectionery tends to cause eczema in previously healthy workmen in England, the desirability of devising and enforcing suitable precautions is immediately suggested. Dr. White said that baker's eczema is unknown in France, and that American statistics point to a similar immunity being enjoyed by workers in the United States.

[1] THE LANCET, Oct. 25th, 1924, p. 859.

Public Health Services.

SCHOOL MEDICAL SERVICE.

YEAR by year increasing space is being given in the general press of the country to reports by school medical officers, some of whom give very full accounts of the work being done and the remedial measures adopted. There is evidence in the reports for 1924, now before us, of a practical desire to interest the layman as much as the statistician.

Name of district.	No. on roll.	Av. elem. school attendance.	No. examined in "code" groups.	Special examinations or inspections.	Percentage of children found on routine examination requiring treatment.†
Ilford ..	10,693	—*	4,007	10,719	40·2
Gillingham	7,540	6,880	2,761	1,690	14·0
Eccles ..	—*	—*	2,315	5,733	22·7

—* = Not given.
† Excluding cleanliness and dental defects.

Ilford.

Dr. A. H. G. Burton, in his report to the urban district council, points out the steady decline of cases of scabies from 146 in 1920 to 5 cases in 1924, and of impetigo from 586 to 256 in the same period, and the small figure of 5·6 per cent. of verminous heads reflects favourably on the interest his public are taking in hygiene generally. The steady rise in the percentage of parents attending the medical examinations to 71 per cent. is encouraging. 13·8 per cent. of the children examined were found to be suffering from unhealthy conditions of the nose and throat, and as 302 children who had either suffered and are suffering from discharging ears or defective hearing are known in the district Dr. Burton suggests that an aural surgeon ought to be appointed. Of 62 per cent. of children requiring dental treatment 62 per cent. accepted it; 13·5 per cent. children required treatment for visual defects, and all who were recommended glasses obtained them.

There was a distinct drop in all the infectious diseases except measles during the year. Dr. Burton hopes that an open-air school may be opened this year to accommodate the 177 pre-tuberculous children in the district. In Ilford no school meals are provided and no special schools exist for physically or mentally defective children. The point is raised of the two definitions of feeble-minded, and Dr. Burton contends that the "social" definition now applied to those over 16 years should be made to apply to all ages, and some other class of certificate provided for children who require special education. This would cause no stigma to the child, and such children could be educated with dull and backward children, and if suitable be transferred later to an elementary school. Such a course would entail institutional care for children certified under the Mental Deficiency Act at prohibitive cost, to say nothing of the parents' objection to having their children removed. As it is now most certifying officers hesitate to certify any child who might ultimately be returned to an elementary school, and statistics show how few of the children once certified ever do return. Dr. Burton, in explaining the paucity of certified children in his area, states that he has avoided notifying as mental defective children who are merely mentally retarded.

In the return of goitre cases 13·8 per cent. had slight enlargement, 2·4 per cent. marked enlargement, and 0·6 per cent. such enlargement as to suggest that treatment may be required. The school nurses carried out 35,450 examinations during the year. From the table of average heights and weights of Ilford boys and girls, which is shown in comparison with the anthropometric standard, it appears that 8–9 year old Ilford boys are 2·78 inches taller and 1·37 lb. lighter than those in the standard.

Gillingham.

From the above statistical table it will be seen that the standard of defect for which treatment is recommended is distinctly low in Gillingham. Dr. W. A. Muir, in his report to the Education Committee of the borough, points out the complete coördination now existing between the various health services, so that the records of ailing children are available from all sources. The hygiene of the non-provided schools in his area is generally below requirements. At routine examinations 7 per cent. of the children were verminous, and at the nurses' surprise visits 13·4 per cent. of the average attendance were verminous. A table showing the percentage of unclean children in each school by introducing a competitive standard should have useful results in the future. The decrease in the incidence of ringworm and impetigo is commented on, but no comparable figures are given for past years. Defects of the nose and throat were found in only 6·3 per cent. of "routine" children, and of those requiring treatment for tonsils and adenoids 55·6 per cent. obtained it, the cost to the authority being £1 4*s.* 6*d.* for the operation. Treatment for defective hearing and disease of the middle-ear was required in 0·94 per cent. of Code group children.

As the dental clinic is open on only three half-days per week only the worst cases of dental caries could be referred for treatment—i.e., 19·6 per cent. of the intermediate and "leaver" groups and 21·6 per cent. of the 5 to 8 year-olds. This condition of affairs is scarcely one on which the local education authority can congratulate itself. The local dentist is an optimist. He writes: ". . . . I am sure I can get 2*s.* for gas extractions for two reasons. Firstly, because most patients are very surprised at the cheapness of the present 1*s.* charge, and sometimes give me an extra amount out of gratitude. . . . When a town-hall is built I trust a proper room may be procured for me, with a recovery room away from the waiting room and the operating room in a north light." 0·28 per cent. of the routine children had pulmonary tuberculosis and 0·79 per cent. were classed as suspicious. No open-air class or school exists for the treatment of these cases. 12,027 school meals were supplied to 230 necessitous children. A plea is put up by Dr. Muir for the local education authority to make some arrangement with St. Bartholomew's Hospital, Rochester, whereby all crippling defects and orthopædic cases would have early and efficient treatment.

No special schools exist in the borough for the education of physically defective and mentally defective children. 1·9 per cent. of the intermediates and "leavers" were found to have visible enlargement of the thyroid gland. Measles, with 366 cases in 1924, as against 97 cases in 1920, was the only infectious disease showing an increase during the year.

Eccles.

Dr. J. E. Spence's report is a record of much work carried on by him unassisted except by a part-time dentist and a part-time ophthalmic surgeon. 8048 inspections is an imposing total for one man who also carries out the treatment in the minor ailment clinic, gives gas for the dentist, and supervises an open-air school, in addition to his work as M.O.H. The division of the work of the four nurses between school services and the public health side enables them to supervise infectious diseases, except scarlet fever and diphtheria, and since they also act as home nurses the confidence and sympathy of the parents are enlisted with beneficial results in the treatment of the school child. The welfare scheme is now coördinated with the school service and ensures continuity of supervision of children from infancy until they leave school, and the correction of remedial

defects in infancy should result in a fall in the number of defects found amongst school entrants.

Stress is laid on the connexion between overclothing (amongst other factors) and catarrhal conditions leading up to much invaliding from otitis and respiratory affections generally. Amongst the code groups 14·5 per cent. suffered from enlarged tonsils and adenoids, 14·1 per cent. from other nasal defects, and 15·7 per cent. from bronchial trouble; 74 children were found to have defects of the ears, and many children with defective hearing were found to have thickened and indrawn drums as sequelæ of old-standing catarrhal conditions. Though the number of verminous children has fallen this year, the number of those unclean had risen, and a slight increase in cases of blepharitis and conjunctivitis is reported. The school dentist examined 3752 children, of whom 2955 required treatment and 1186 were treated; 149 minor eye defects were treated at the clinic, and 162 were referred for refraction; glasses were prescribed in 123 cases, and obtained by 102 children. Six cases of organic heart disease and 130 cases of functional cardiac disturbance were noted. In view of the widespread interest now taken in rheumatism in its damaging effects on the heart, the past history of all cases of acquired organic carditis would be helpful.

The work of the open-air school is reviewed. The average gain in weight per child was 0·8 lb. per month. The cost per child to parents who can afford it is 5*s*. per week, and parents paid £283 3*s*. towards an outlay of £372 17*s*. for meals, medicine, car fares, &c. A table showing the length of stay, gains in weight, and general condition of each child in the open-air school is given. Apart from the open-air school 31 children who were ailing or convalescent were sent into the country under the auspices of the Manchester and Salford Children's Aid Association. No special schools as yet exist in Eccles for the education of physically or mentally defective children.

PORT SANITARY AUTHORITIES.

IN the letter introductory to his annual report for 1924 to the *Cardiff Port Sanitary Authority*, Dr. R. M. F. Picken, the medical officer of health, observes that, although no case of plague has occurred in Cardiff for many years, the chance of the spread of the disease has been a constant cause of anxiety. This was much accentuated in 1924 when a ship, which lay for a while in harbour during the summer, and was on arrival reported free from rats and "all well," and was later examined and "no rats found," was again inspected shortly before leaving and given a clean bill of health, and yet two cases of plague developed on board a fortnight later, the ship not having meanwhile touched at any other port. At Suez she was fumigated and ten rats killed. As a consequence ships are now inspected for rat infestation even more carefully than before. Dr. Picken saw two ships fumigated with hydrocyanic acid to destroy rats and thinks the method employed to be, in the hands of experts, without danger and the most efficient and expeditious means of freeing a ship from rats and all vermin. One small-pox patient, though discharged after treatment from a hospital abroad, was found on arrival at Cardiff to be still infectious; five of the crew were vaccinated and no subsequent cases occurred. The question of providing latrines ashore in sufficient numbers to permit the sealing of the water-closets of all ships in dock is under consideration. This very important matter came to the front in 1924 owing to the visits of naval vessels with large crews. In the report itself we find that the infectious diseases that came most frequently under notice were malaria 25 cases, pneumonia 11, and tuberculosis 5, or perhaps 17. There were no cases of cholera, plague, or yellow fever, and the hospital at Flat Holm Island, kept always ready for them, has been unused throughout the year. Many rats have been killed: in ships, by baits, 1480 (all black), averaging 39 per ship; by sulphurous acid 66, 9 per ship, and by hydrocyanic acid 44, 22 per ship; 4449 rats and 1097 mice were killed about the port by baits, and 437 in warehouses. Dead rats (104) were examined but none were plague-infected. On 214 rats examined for fleas, *Xenopsylla cheopis* was most frequently found, but never on rats from outside the port sanitary area; *C. fasciatus* was found on a rat caught in the town, and *X. brasiliansis* was found, for the first time in Europe, on a rat killed on board a ship from Brazil. The fleas were identified by Mr. J. J. Simpson, keeper of zoology, National Museum of Wales. The number of venereal cases attending the seamen's clinic for the first time (615) decreased in 1924 by a quarter, but the total attendances (16,212) increased by a sixth. Fifty of these cases were recommended for hospital treatment. Of scabies 26 cases were treated among seamen; no men were found verminous. None of the 354 aliens who passed through the port suffered from infectious disease. The lighters of the port have been examined, cleansed, and disinfected; the fishing boats and wharves have been regularly visited, cleansed, and disinfected. Inspections were made of 7086 vessels with 126,057 men in their crews. There were disinfected 887 articles of clothing and 1861 beds were destroyed. In 609 ships 1532 structural defects and other nuisances were detected, dirty quarters in 627, defective side lights in 298, 111 forecastles were verminous, 83 water-closets were dirty, 78 stoves in crew spaces were defective, in 50 cases water-closets or paint stores ventilated into crew spaces, and in another 50 the drainage of crew spaces was defective. Nearly all of these and the other 235 defects were put right, and the note in the report is correct that these figures prove useful work done by the staff of the authority and imply a great improvement in the sanitary surroundings of the seamen whose ships reach Cardiff. Ventilation and lighting are being improved, and dirt, smell, and dampness are being diminished. Defects were noted in less than 10 per cent. of the ships. Of 206 samples of drinking water from ships examined, 49 were condemned; the tanks concerned were emptied and cleansed. Some 350 tons of imported food, chiefly fruit, were condemned and destroyed. The sanitary condition of the canal boats is reported as on the whole satisfactory.

In his annual report for 1924 to the *Tyne Port Sanitary Authority*, Dr. W. E. Harker, medical officer of health, states that 82 vessels were visited by him on account of reported or suspected sickness on board; five cases of typhoid fever, one of diphtheria, and various slighter cases were removed and necessary disinfection done. No infectious disease was found among the 13,462 alien passengers, who were mostly clean. No case of plague, cholera, or yellow fever came under notice in 1924, but 5492 rats, none of them plague infected, were caught; 197 were killed with sulphur dioxide in 15 ships; hydrocyanic acid was not used. The dead rats were burnt in the ships' furnaces. Of the rats, two-thirds were black, one-third were brown; the largest number of rats caught in any month was 961 in October. Thirty-one ships from ports known or suspected to be infected with cholera had their drinking-water tanks emptied and purified. The chief diseases reported during the previous voyages or found on arrival were, accidents 197, venereal disease 122, feverish colds 114, undefined 96, malaria and influenza each 41, 10 cases of consumption, and 13 of typhoid fever with 5 deaths. The main imports into Newcastle were wheat, sugar, and other foods, of which there were condemned 1220 lb. peas, 10,898 lb. plums, 140 lb. potatoes, and three bags of wheat. The fish landed was good, but 35 of 8326 fishing vessels had to be cleansed and deodorised. In 10,076 inspections of ships, sanitary defects were found more often in foreign-going (13 per cent.) than in coasting (3 per cent.) ships. Peaks, forecastles, w.c.'s, and bilges of 1168 vessels, British and foreign equally, were found dirty and were cleaned. 1201 old beds were burnt. Structural defects were notified and rectified; side ports for refit 461, deck leaking 153,

defective w.c.'s 135, defective stoves 36, water tanks cleansed 31, deficient ventilation 12, deck of forecastle for repair 7, paint (store) to be removed from bow locker 6, defects of drainage 6, of bulkhead 4, of lighting 1, and 1 iron deck was sheathed with wood. The 18 water boats of the port were examined and their tanks found in good condition. No master was summoned for evolution of dense smoke. The floating hospital is used for isolation and treatment of the more dangerous infectious diseases from abroad, also as a cleansing, disinfecting, and disinfesting station. Other infectious cases are sent to the city infectious hospital. The usual measures are taken for relief of venereal cases; there is no estimate of their usefulness.

INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 2ND, 1925.

Notifications.—The following cases of infectious disease were notified during the week, namely:—Small-pox, 176; scarlet fever, 1564; diphtheria, 769; enteric fever, 40; pneumonia, 970; puerperal fever, 45; cerebro-spinal fever, 10; acute poliomyelitis, 3; encephalitis lethargica, 55; continued fever, 1; dysentery, 7; ophthalmia neonatorum, 110. There were no cases of cholera, plague, or typhus fever notified during the week. The number of small-pox cases showed an increase of 6 over the number for the preceding week. Fifty cases were notified from Derbyshire (Derby C.B., 38); 11 from Northamptonshire (Kettering, 7; Desborough, 4); 38 from Northumberland (Prudhoe, 19); and 49 from Yorks, North Riding (Middlesbrough C.B., 45).

Deaths.—In the aggregate of great towns, including London, there was 1 death from enteric fever, 103 from measles, 11 from scarlet fever, 93 from whooping-cough, 25 from diphtheria, and 100 from influenza, as compared with 139, 162, 221, and 242 in the four preceding weeks. In London itself the deaths from influenza numbered 15, from whooping-cough 23, and from diphtheria 6.

Small-pox in Derby.—The medical officer of health of Derby reported to the town council on May 6th that the cases now numbered 147, compared with 102 last month. Since the outbreak in Derby in 1924, the great majority of the cases, he said, had been of the mild type. Recently there had been a larger proportion of a more severe type. The expenditure incurred during the financial year ended March 31st, 1925, was £5600.

Obituary.

THE LATE DR. REGINALD DUDFIELD.

Dr. Major Greenwood writes: "Absence from England when the lamentable news of Dr. Dudfield's death was received prevented me from adding a few words from the statistical side to your account of his career.[1] Dr. Dudfield was an important, in some respects the most important, member of the tiny group of English medical statisticians. He was the only senior member of the municipal public health service to whom statistical science was a principal interest. Others—it would be invidious to mention names—have, of course, done valuable statistical work, but Dudfield alone for more than a quarter of a century took a regular part in the work of the Royal Statistical Society, contributing many valuable papers to its journal and never grudging time and energy for the heavy work which has to be performed by the council and committees of a large scientific society. I have said that Dudfield was in some respects the most important member of our group. The reason is this. He was particularly interested in aspects of statistical work which *must* be studied if we are to progress, but which are not very attractive to most investigators. He was, indeed, a good investigator, as his paper on Epidemic Diarrhœa (read before the Epidemiological Section of the Royal Society of Medicine in 1912) proved; but his greatest energy and enthusiasm were reserved for the, as many think, dull work of reforming the basis of statistical investigation, rendering the data more precise. Most medical statisticians will recall his labours on the statistics of stillbirths, and if in this and in other countries more precise information on that topic is made available in the near future, Dudfield is the man to whom the reform will mainly be due. Within a few weeks of his death he attended at Geneva an international committee appointed by the Section of Hygiene of the League of Nations where this subject was discussed, and I have reason to believe that his share in the work of the committee was very large. 'I know the map of England, as well as the noble lord, or as any other person; and I know that the way I take is not the road to preferment.' Dudfield might have said that with as much justification as Burke. Patient and sagacious labouring to improve the raw material of statistics leads neither to academic honours nor to official promotion. But when, if ever, a true history of scientific progress is written, the name of Reginald Dudfield will be given precedence of names more often upon our lips. At least his old friends and colleagues in the work of the Royal Statistical Society and the Epidemiological Section of the Royal Society of Medicine realise how great a loss they have sustained."

[1] THE LANCET, April 25th, p. 898.

HENRY TRENTHAM MAW, M.D. CAMB.

Dr. Henry Maw, chairman of directors of the firm of S. Maw and Sons, Ltd., manufacturers of surgical instruments and appliances, died on April 23rd at the age of 58. Dr. Maw was educated at Repton and Christ's College, Cambridge, and studied medicine at St. Bartholomew's Hospital, which he entered in 1890. He took the diplomas of L.R.C.P. Lond. and M.R.C.S. Eng. in 1892, and graduated M.B., B.C. Camb. two years later, gaining the M.D. in 1896. He held hospital appointments as house surgeon at the Leeds Infirmary and in London at the Children's Hospital in Great Ormond-street, and was for a time medical officer at the Royal Chest Hospital, City-road. Upon joining the firm, which was established by George Maw in 1807, Dr. Henry Maw took over the management of the surgical instrument department, and continued to occupy that position until his death. He became a partner in the firm in 1901 and acted as chairman of the company from 1918. He was honorary treasurer of the National Union of Manufacturers and was also an official of the Surgical Instrument Manufacturers Association. Dr. Maw took infinite pains in all he did, and it was this quality associated with the will to please that assured his success in various walks of life.

DONATIONS AND BEQUESTS.—Miss Jane Ada Trenow, Richmond, Surrey, besides other bequests, left £1000 to the Zenana Bible and Medical Mission, and £500 to the Mission to Lepers in India and the East.—Miss Isabella Seymour, of South Eaton-place, London, S.W., and Aix-les-Bains, bequeathed £6000 to charities, including £2000 to St. George's Hospital, London; £1000 to the Belgrave Hospital for Children, Clapham-road, London, S.W.; and £1000 each to the Hôpital Etablissement des Baines (Roman Catholic), the Asile (Protestant), and Hospice Brachet, all at Aix-les-Bains.—The Christie Hospital, Manchester, has received £2500 from the executors of the late Mr. Edwin Kershaw, of Bolton, as payment on account of the residuary estate (amounting to about £4000) which Mr. Kershaw bequeathed to the hospital.—The students of Aberdeen University have raised fully £4000 on behalf of the hospitals in Aberdeen.—Miss Eliza Entwistle, of Longsight, Manchester, left £1000 each to the Manchester Children's Hospital, Ancoats Hospital, and the Christie Cancer Pavilion; £500 to the Ardwick and Ancoats District Nursing Home; £100 each to the Manchester Surgical Aid Society and the Disabled Folks Guild, Ancoats; and £350 to the Manchester and Salford Blind Society, subject to a life interest. The residue of the property to be divided between the Manchester Royal Infirmary, St. Mary's Hospitals, Manchester, and any other charitable institutions the executors may select.—The St. Mary's Hospitals, Manchester, have received £1500 from the executors of the late Mr. James Parr.

Correspondence.

"Audi alteram partem."

THE ALLEVIATION OF CHRONIC PROGRESSIVE DEAFNESS.

To the Editor of THE LANCET.

SIR,—The interesting and instructive paper on the above subject published in your last issue by Mr. George C. Cathcart, calls for the serious attention of all otologists considering the almost invariably unfavourable result from treatment in cases of chronic progressive deafness whether due to pathological states of the auditory nerve or to chronic adhesive changes in the middle ear.

Modern surgery, with all its brilliant achievements, has up to now been unable to design any operative procedure which has afforded anything but a merely temporary improvement in those cases where definite thickening of the mucosa has taken place or where advanced adhesive changes have been noted clinically. One can understand that in cases of nerve deafness, where there is frequently a functional as well as an organic element, a certain improvement is possible by re-education with sonorous vibrations, but my difficulty is in grasping how advanced pathological thickening of the tympanic mucosa and stapedio-vestibular adhesions in cases of chronic dry catarrhal otitis media and pathological changes in the bony elements of the pars petrosa of a "porous" nature, as in otosclerosis, are capable of being materially altered by sound-vibration treatment even if a hyperæmia is induced as the result of mechanical sound waves of varying pitch and intensity.

The fact that 81 per cent. of Mr. Cathcart's nerve cases improved, whereas the improvement in the cases of chronic otitis media and otosclerosis was respectively 67 and 55 per cent., shows that the former are more prone to respond to this method of treatment than either of the other types of deafness. Is this due to the effect of the treatment or the frequently existing functional element?

I venture to suggest that Mr. Cathcart should continue his investigations and should experiment on certain deaf animals—e.g., dogs or cats—and after a course of treatment have a careful histological examination of the middle and internal ears made. If only it were possible to have the treatment based on sound pathological observations its reception by otologists would be more enthusiastic than it is at present. At the same time, I desire to say that the results presented by such a careful and conscientious observer as Mr. Cathcart is should not be too lightly dismissed even if at the present time pathological evidence of what actually does take place is not forthcoming. Otology has all along suffered from lack of pathological investigation, partly on account of the difficulty of securing good sections of the temporal bone, and more especially from the fact that patients do not die from such diseases as chronic catarrhal otitis media and otosclerosis.

Mr. Cathcart deserves great credit for his endeavours to do something to alleviate the hard and depressing lot of those whose hearing is so poor as to debar them from social intercourse.

I am, Sir, yours faithfully,

Manchester, May 10th, 1925. WILLIAM MILLIGAN.

CANCER AND INNERVATION.

To the Editor of THE LANCET.

SIR,—At the conclusion of a leading article on the Anatomical Distribution of Occupational Cancers allusion is made to Dr. W. Cramer's experimental support of my clinical observations on the relation of innervation to cancer. What can be the meaning of it all? Can it be that the presence of rodent ulcer acts as a stimulus that induces a dilatation of blood-vessels, which encourages its growth within the affected area? This does not appear to me to be the whole explanation, for many reasons that would take too long a letter to describe. The answer is complicated by realising that that which influences the spread need not necessarily affect the genesis of a rodent ulcer, although both its incidence and spread appear, from my clinical observation, to be very closely connected with the nervous system. It may suffice here to indicate that during one type of the natural acquirement of grey hair the greyness begins in beards on four points—viz., the two points where the mental nerves become cutaneous, and the two points where the great auricular nerves become cutaneous, thus making on the same beard four symmetrical points of beginning greyness, which cannot be a matter of accident or coincidence. As the greyness of the hair covering the skin and lower lip continues, an area exactly corresponding to the mental nerve area, as mapped out by Dr. Henry Head, is delimited by greyness. This appears to me a most interesting and profoundly important observation. It demonstrates a distinct relationship between an epithelial change (though it may be only one of loss of pigment), which is under an influence of the nervous system. Hair follicles, although near neighbours to each other, are really separate establishments, yet each is involved in this process of greyness within the nerve area under demonstration. Hence a nerve influence, or modification of nerve influence, upon the incidence and genesis of pathological new growth appears to me a very much more subtle thing than can be explained by only an alteration in the local blood vascular system.

There may be two distinct nervous influences in operation—one that concerns the incidence and genesis of rodent ulcer, and the other that affects only its spread. Now that Dr. Cramer's ingenious experiments have called attention again to the matter, I hope it will receive the attention I believe it deserves. I should like to remind you that I have shown clinical evidence that demonstrates a relationship between infective processes and nerve areas. Hence the question of acquired and natural immunity is also concerned in a local nervous relationship between host and the infective process.

I am, Sir, yours faithfully,

G. LENTHAL CHEATLE.

Harley-street, W., May 8th, 1925.

THE TREATMENT OF EXCESSIVE LOSS AT THE PERIODS.

To the Editor of THE LANCET.

SIR,—If to condemn utterly is better than to damn with faint praise, then the advocates of X ray treatment may be grateful to Mr. Victor Bonney for small mercies. In your issue of May 2nd, referring to cases of excessive bleeding in which no myomata are present, he says:—

> "X ray treatment is as much to be condemned in these cases as it is in cases of fibroids, under which heading I will refer to it more particularly."

After keeping the trembling radiologist in suspense for a whole week, he proceeds (THE LANCET, May 9th, p. 990) as follows:—

> "The treatment of fibroids by X rays I heartily condemn. It is, in effect, a revival of the bad operation of double oöphorectomy . . . in quite a number of cases neither the bleeding nor the growth of the tumour was checked (by this operation). X rays effect a bloodless oöphorectomy followed by results exactly the same and exactly as variable. . . . Moreover, I have seen irradiations followed by acute septic degeneration of the tumour, and by severe X ray burning of the abdominal wall. . . . The ideal surgical procedure cures without disturbing either function or normal structure."

Here, indeed, is strong doctrine—no subtleties—all plain black and white. How simple it would be if I could say ex cathedra that Mr. Bonney's black is white and his white black! But twenty-one years of practice, whether they have taught me much or little, have, at

least, convinced me that truth is many sided, and I cannot oppose dogma to dogma. Nevertheless, I venture to assert (1) that any operation has a certain mortality; (2) that post-operative shock in a nervous patient is often severe and lasting; (3) that in some cases the excessive bleeding continues after the removal of the fibroids; and (4) that there are great numbers of cases on record in which a permanently satisfactory result has followed the treatment of fibromata by X rays.

It remains true that surgical removal is the treatment of election in women under 40, because, unless one produces an artificial menopause, it is impossible by X rays to reduce fibroids to permanent inactivity. After 40, X rays may be seriously considered as an alternative to surgery. *Pace* Mr. Bonney these effects are not simply those of a surgical oöphorectomy. The rays have an action on the tumours as such—temporary if the ovaries remain intact, but usually permanent if the ovarian activity is brought to an end. The power of X rays to cause *local* disappearances even of malignant tumours is not disputed, and it is surely not surprising that they can cause shrinkage of an innocent growth such as a fibroid. As to any disturbance which may follow an artificial menopause, the work of Groedel, Werner, and Borak [1] has taught us how to deal with these by checking the unbalanced action of the pituitary or the thyroid, on which they appear to depend.

The radiologist freely admits that, even in women over 40, there are many cases of fibromata which are unsuitable for X ray treatment. Large tumours should not be so dealt with as a rule, and the presence of sepsis or degeneration are contra-indications. In seeking to exclude these conditions he would be glad to have the aid of the gynæcologist—but is it in human nature that he should seek the coöperation of one who would like, metaphorically speaking, to burn him and his writings at the stake?

Mr. Bonney's reference to skin damage by X rays after sterilisation cannot be accepted in these days as a valid objection, provided that the treatment is carried out by a competent radiologist. Up to three or four years ago it was necessary to give a "full skin dose"—i.e., a dose just short of that producing a definite erythema—in order to get a sufficiency of radiations into the ovaries. Now, with improved apparatus and technique, only one-third of this is essential on any given area, which leaves a margin of safety of over 60 per cent. The X ray treatment of fibroids is admittedly of limited applicability. I will not venture to express an opinion as to what proportion of all cases are suitable. It is, indeed, impossible for any radiologist to obtain the data upon which an estimate could be based. It is equally impossible for the gynæcologist to judge of the successes of X ray treatment; he sees only the failures, just as the surgeon does in the case of Graves's disease. On the other hand, to the radiologist come some of the patients whom myomectomy has failed to relieve from the excessive losses on account of which they originally sought advice. To attempt to judge the value of the operation of myomectomy from a consideration of such cases would be manifestly unfair.

I now pass from this debatable ground to the use of X rays in cases of excessive bleeding where no tumours can be found. Such lesions as retroversion of the uterus or erosion of the cervix may be present, but operation should not be recommended for these conditions with a promise that the hæmorrhage will be benefited, as often it is not. Excessive menstrual bleeding often occurs in virgins, and may be accompanied by no detectable abnormality. It may then be termed "idiopathic" and appears to be associated with excessive production, or vitiation, of the ovarian hormone; it is amenable to the same type of radiation treatment as is so often successful in exophthalmic goitre. X rays in small repeated doses have the power of regulating thyroid secretions without in any way damaging the gland. It is never justifiable to push X ray treatment of the thyroid to the point of injuring it; and the same holds good with regard to the ovaries in the treatment of menstrual disorders in young women. I will now, in my turn, be mildly dogmatic, and say that X rays, properly applied, have an almost specific effect upon "idiopathic" excess at the monthly periods. They may also, in some cases, relieve painful menstruation when bleeding is not a prominent feature; but their sphere par excellence is in dealing with hæmorrhage. This is not the place to quote cases, but anyone interested may refer to my paper on the subject in THE LANCET (1919, ii., p. 432).

The crude idea of destruction—even selective destruction—is quite out of date in radiation therapy. That of *regulation* is taking its place, especially with regard to the functions of the ductless glands. We know that we can by X rays check excessive activity of the thyroid, ovaries, or pituitary. We can stimulate the thyroid by electricity, and there is some ground for believing that adrenal secretion is increased by ultra-violet rays. The X ray treatment of endocrine disorders—under which heading must be included many forms of menstrual disturbance—is not in any sense bloodless surgery, but a rapidly progressing branch of physiological therapeutics.

I am, Sir, yours faithfully,

F. HERNAMAN-JOHNSON.

Harley-street, W., May 9th, 1925.

[1] Brit. Jour. Radiol., August, 1924, p. 293.

TREATMENT OF ACUTE PERITONITIS.

To the Editor of THE LANCET.

SIR,—In the excellent article on this subject printed in your issue of April 4th the principal traits of the diagnosis of the disease are touched upon. I shall take the liberty to make some additions to the diagnostical procedures proposed by Mr. Jeans and mentioned also by Mr. Zachary Cope.[1] Both of them advise in cases of difficult and doubtful diagnosis the making of a short exploratory incision of the abdominal wall. I am also of this opinion, but since the exact microscopic analysis of any peritoneal fluid is of great importance, I make only a very small incision in the abdominal wall, not only in order to see and smell the escaping liquid, but also to withdraw some of the fluid by means of a pipette introduced into the cavity and to subject it to microscopical examination. In my experience the cells in the normal peritoneal fluid are 70 per cent. lymphocytes. In cases even of early peritonitis the ratio of lymphocytes to other forms of cell becomes much smaller. Besides this, in cases of peritonitis caused by small perforations the contents of the organ perforated may be found. In very early cases, where there may be very little fluid, it is useful very gently to scrape the peritoneal contents of the parietal peritoneal wall with a spoon. This practice is adopted by me only in difficult and early cases and has proved to be a very useful guide. In a paper read before the Congress of Surgeons of South Russia in Odessa in 1924 I named this little operation *laparotomia minima*. It is performed under novocaine anæsthesia. The place of incision, in my opinion, is not of great importance, but it is better to cut in at the point of the supposed source of infection. The operation can be performed in bed. The length of incision required depends on the amount of subcutaneous fat, but need never exceed one inch. Simple puncture of the abdomen must be avoided, owing to the danger of perforating distended intestine.

I am, Sir, yours faithfully,

SERGE LIGIN,
Surgeon at the Labour Hospital, Nikolajeff,
April 27th, 1925. South Russia.

[1] THE LANCET, 1924, ii., 806.

THE Twelfth International Physiological Congress will take place in 1926, at Stockholm, from August 3rd to 6th. The Congress will be under the presidency of Prof. Johansson. Prof. Liljestrand will be hon. secretary and Prof. Santesson hon. treasurer.

HEALTH INSURANCE IN THE IRISH FREE STATE.

AN Interim Report of the Committee of Inquiry into Health Insurance and Medical Services in the Free State was issued last week. The Committee was constituted as follows: Prof. J. B. Magennis (chairman), Sir Joseph Glynn, Canon McHugh, Dr. W. J. Maguire, Dr. R. J. Rowlette, Dr. E. F. Stephenson, Mr. James Hurson, Mr. James G. Kydd, and Mr. J. J. McElligott, with Mr. W. J. Kavanagh (secretary). With the exception of the Chairman, Canon McHugh, and Dr. Rowlette, the Committee was composed of officials concerned with National Health Insurance or Local Government work.

Terms of Reference.

Appointed in May, 1924, the Committee was asked (1) to inquire into and report on the advisability of the continuance of the present system of National Health Insurance, and to make any recommendations which the Committee considers proper in that connexion; (2) to consider whether it is desirable to institute a system of medical treatment on a contributory basis, and, if so, to advise as to the form which such system should take; and (3) to examine and report on the question whether the medical services at present assisted or maintained out of State or local funds can be improved as respects efficiency and economy, and, if so, in what manner, due regard being had to any recommendations made under the preceding paragraph.

A large number of witnesses were examined, including representatives of the Government departments concerned, the approved societies, the Labour Party, the medical profession, and the local authorities. The Interim Report is concerned mainly with the first of the terms of reference, and deals only in general terms with the second and third. The Committee received an overwhelming body of evidence in favour of the continuance of National Health Insurance in the Free State.

High Cost of Administration.

Certain points in the present administration of health insurance received special study. The cost of central administration appears abnormally high, in that it costs 3*s.* 8½*d.* per insured person in the Free State, as compared with 1*s.* 4*d.* in England. The Irish Commission submits that the method of calculating the expense at cost per head of the insured population is misleading and unfair; for it points out that there are over 1½ millions of insured persons in England compared to 450,000 in the Saorstát, and that the overhead charges must be greater proportionately to numbers in the Saorstát than in Great Britain for administering the same type of machine. There are, moreover, other reasons why the cost of central administration is relatively higher in the Saorstát than in Great Britain. Among others it appears that compliance in Great Britain, excluding domestic servants, is about 99 per cent. of the insured population. In the Saorstát the total, without exclusions, is only from 65 per cent. to 70 per cent. Non-compliance creates increased work for the Commission's staff. For the ten years ended March, 1924, the Irish Commission dealt with 15,200 disputed transfers. In the same period Great Britain, with an insured population 18 times that in Ireland, dealt with only 50,000 disputed transfers. From January, 1922, to Sept. 30th, 1924, in England with 12½ millions of insured people there were only 62 appeals. The Insurance Commission in the Saorstát with 450,000 insured persons dealt with 81 appeals. In Scotland with four times the Irish insured population there were only 44 appeals and in Wales no appeal until 1918. The Committee adopts the view that if there were proper compliance with the provisions of the Insurance Act the cost of central administration could be largely reduced. The main fact which emerges on this point is that the Insurance Organisation as set up in 1911 in Ireland is costly because it copies exactly that set up for Great Britain which, apart from its greater wealth, has a huge industrial population concentrated in convenient centres.

As regards compliance, the Committee believes that with the re-establishment of ordered conditions throughout the country compliance will become more general. The Committee recommends that greater powers should be given to the inspectorial staff of the Insurance Commission and that a publicity campaign should be organised to bring the benefits of the Acts before those for whom specially they were designed. Among some minor reforms the Committee recommends that the period during which notice of illness should be given by an insured person should be extended from three to seven days.

Approved Society Control.

The majority of the Committee recommends a very radical reform in the system of administration of health insurance—the amalgamation of all approved societies into one society. A strong case is made against the existing system, under which administration is in the hands of some 80 approved societies. It is said that there is overlapping of societies, inequality of benefits, lack of uniformity of administration, unnecessary expense both in the societies and in the office of the Commission. It is noted that the representatives of the approved societies (with the exception of the trade societies) were opposed to any radical alteration of the present system of administration by approved societies. The representatives of the Irish Labour Party and of the Trade Union Approved Societies, on the other hand, were in favour of a scheme of nationalisation, but failing that nationalisation, were willing to accept unification. Dr. Rowlette dissents from the majority of the Committee in regard to this recommendation, and in a separate note recommends that the whole system of insurance should be nationalised and committed to the care of a department of Government.

Advantages of Nationalisation.

Dr. Rowlette believes that such concentration in a Government department would have the following advantages: (1) The direct responsibility of a Minister to Parliament for the entire administration of National Health Insurance. (2) The coördination of National Health Insurance with the health policy of the country, and with the whole scheme of preventive medicine. (3) The possibility of readily fitting in National Health Insurance with any other form of social insurance which the country may decide to adopt in the future. (4) A greater immediate economy than can be attained, without loss of efficiency, by any other method. Even if there were to be only one approved society, he suggests, as the majority of the Committee recommends, there would still be considerable duplication of duties, as identical records on certain matters must be kept by the society and by the Commission or controlling authority. Such duplication would disappear if all administration were merged in one body. He further suggests that the creation of a society comprising in its membership all the insured persons in the Free State would not be free from danger. Such a society would be so large and so powerful that it would be beyond the control of either the official supervising authority or of the Oireachtas. It would be to the interest of such a combine to gain a power on each of the parties of the State, and to attempt to pervert Government at its source. So far from the diversity of elements in the society tending to prevent its exercising a political power, the fact that it contained very diverse elements would give it all the greater power in the underworld of politics. Moreover, the farming out of health insurance to a society created for the purpose would appear to be a mere shelving of the responsibility belonging to the State itself. In the words of one of the witnesses, "Unification would be nationalisation without responsibility."

Provision of Medical Benefit.

In reference to the second of the terms of reference, the Committee points to previous recommendations in favour of the provision of medical treatment for insured persons in Ireland, and it recommends, Mr. McElligott dissenting, that medical treatment on a contributory basis should form part of National Health Insurance. The Committee recognises, however, that the provision of medical benefit is mainly a problem of finance, and in the absence of fuller information as to the funds that may become available from insurance sources (in addition to those at present devoted from various sources to purposes of medical treatment), and as to the position which such arrangements would occupy in relation to the medical charities system, is unable in this interim report to formulate a scheme for the provision of medical treatment. It is hoped, however, that the valuation of the approved societies, the preliminary operations of which are at present proceeding, will be sufficiently advanced by the autumn of this year to enable definite recommendations to be made on the second—as well as on the third—of the terms of reference.

Present Medical Services.

In reference to the third of the terms of reference, the Committee reviews the present medical services of the country, and makes some sharp criticisms of the dispensary medical services. It admits that the present system of appointment is objectionable and sometimes corrupt, and that "the members of local authorities are not always competent to decide the merits of professional candidates." It is admitted, too, that many of the dispensary buildings are unsuitable. The increase of salaries, as shown by the average figures for the year ending March 31st, 1924, as compared with the figures for 1904—admitted to be grossly inadequate—is more apparent than real, owing to the greatly increased cost of living. The Committee recommends that provision should be made for "study leave" for dispensary medical officers.

A National Medical Service.

The report closes with a summary of the recommendations previously made in favour of a National Medical Service, and states that for a number of years there has been a growing volume of opinion in favour of such a service. Definite recommendations on this point are not made in the interim report, but the subcommittee is to consider the entire matter in the light both of past reports and of existing conditions and thus, it is hoped, enable the Committee to frame a comprehensive scheme which, under some form of national medical service, will combine the medical treatment of the insured with the medical treatment of the poor.

Mr. McElligott does not sign the general report, though he agrees with many of the recommendations. He dissents from every recommendation in favour of medical treatment until there is fuller knowledge from the financial side.

THE BATEMAN APPEAL.

As already explained in THE LANCET, it has been felt that material assistance ought to be offered to Dr. Bateman to meet the legal expenses of his recent successful appeal against conviction and to make good the deficiency in his professional income. Accordingly, the Bateman Fund has been opened and lists of contributions have appeared in recent issues. We have received additional contributions as follows:—

	£	s.	d.
Already received and acknowledged ..	436	13	6
Mr. W. C. Bull	5	0	0
Dr. A. G. Andrews	1	1	0
Dr. M. A. Collins	1	1	0
Dr. E. Fisher	1	1	0
Dr. Geoffrey Nootт	1	1	0
Dr. A. Graham-Stewart	1	1	0

Remittances should be forwarded to the Manager of THE LANCET, 423, Strand, W.C. 2, and made payable to the "Bateman Fund Account."

LISTER INSTITUTE OF PREVENTIVE MEDICINE.

THE annual report of the governing body of the Lister Institute for the year 1924–25 includes brief summaries of work done in the six departments of the Institute under the general direction of Prof. C. J. Martin, F.R.S., and a brief note on the work of the National Collection of Type Cultures (Medical Research Council) which is housed in the Institute under the supervision of Prof. J. C. G. Ledingham, F.R.S.

We can only indicate a few of the important investigations which have been undertaken in the several departments.

In the department of *Bacteriology* Prof. Ledingham has continued his study of the virus of vaccinia and avian molluscum, and is investigating material from cases of the mild small-pox now prevailing in England. Dr. J. A. Arkwright has continued his work on bacterial variation and the bacteriophage phenomenon in association with Dr. S. S. Zilva. Dr. Arkwright has also studied the inflammatory reaction produced by irritants in guinea-pigs and in rats, with special reference to the influence of bad nutrition on the intensity of the reaction. In young growing animals the influence is obvious, and an attempt is being made to identify the dietary factors on which a large inflammatory reaction depends. Dr. S. P. Bedson has investigated the effect of splenectomy on experimental purpura in guinea-pigs. He concludes from his experiments that the spleen plays no essential rôle in the production of purpura, and suggests that splenectomy cannot be relied upon to give permanent relief in the treatment of purpura hæmorrhagica. Dr. H. L. Schütze has carried out a series of immunity tests in guinea-pigs with various plague prophylactics in view of the considerable demands on the Institute for plague vaccine for use abroad. A vaccine prepared by the Institute method, using agar flushed with serum, was tested against Haffkine's prophylactic on guinea-pigs and yielded a survival percentage of 44 per cent., Haffkine's prophylactic yielding only a 14 per cent. survival rate. The dose of *B. pestis* administered to the immunised guinea-pigs was that which killed 100 per cent. of control animals.

In the department of *Biochemistry*, under the direction of Prof. A. Harden, F.R.S., experiments bearing on the conditions under which the enzyme in living yeast and in yeast preparations exists are being undertaken. The conditions under which fat and carbohydrate are synthestised by vegetable organisms are being studied by Dr. Smedley Maclean. Since the benefit ascribed to chaulmoogra oil, its soaps or ethyl esters in the treatment of leprosy had led to the recommendation of similar compounds as a remedy in tuberculosis, experiments upon the value of chaulmoogra oil in the treatment of tuberculosis have been carried out in this department. Dr. Schütze and Dr. Zilva find that soaps of chaulmoogra oil, although they have a very decided bactericidal action on the tubercle bacillus in vitro, do not perceptibly impede development of the bacillus in vivo.

In the department of *Experimental Pathology* a great deal of work is being done on the vitamin contents of milk, cod-liver oil, green leaves, and other substances, by Dr. Harriette Chick, Dr. Ethel M. Luce, Miss M. A. Boas, and their colleagues. Dr. Chick is endeavouring to ascertain to what extent plants are dependent upon sunlight for the manufacture of vitamin A and anti-rachitic vitamin respectively. The first question has practical importance connected with the feeding of cattle designed to provide food in the form of meat and milk. The second has a wide scientific significance in regard to the origin of fat-soluble vitamins in nature. The inter-relation of vitamins and ultra-violet radiations is the subject of study by Miss E. H. Hume and Miss H. H. Smith. Dr. T. Lumsden's tissue culture work is familiar to our readers (THE LANCET, 1924, ii., 65; 1925, i., 383).

In the department for the *Study and Preparation of Antitoxic Sera*, an infection attacking the breeding stock of guinea-pigs, which occurred during the latter part of the year, led to a study of puerperal infection among these animals. The breeding sows alone were infected; the boars and young animals were exempt. Deaths occurred within a week or so of kindling down. The disease appears to be a chronic one, but becomes acute post partum. A pneumococcus was readily isolated from the heart blood and uterus of fatal cases, and in some instances from pneumonic patches in the lungs. It was also found in the fœtus. With the object of producing an active immunity the whole stock of guinea-pigs was treated with a multivalent vaccine prepared from the strains isolated. The results were encouraging.

In the department for the *Preparation and Study of Anti-Variolous Vaccine* at Marazion, Cornwall, Dr. A. P. Green has been studying the reaction of animals to revaccination. As found by Pirquet and Prowazek some years ago, an accelerated reaction was observed. This allergic response occurred about 24 hours after inoculation and was characterised by marked erythema and slight swelling at the seat of inoculation. The effect was transient. It was observed in all the animals experimented with. The occurrence of an accelerated reaction to vaccination has been recommended for the diagnosis of doubtful cases of small-pox, but in view of the above observations its applicability would appear to be confined to unvaccinated persons.

Foot-and-Mouth Disease.—In August last the governing body of the Institute agreed to place one of its laboratories, together with a suitable isolated and self-contained animal house, at the disposal of a committee appointed by the Ministry of Agriculture to investigate foot-and-mouth disease. The committee is presided over by Sir William Leishman, and includes Prof. W. Bulloch, Prof. C. J. Martin, and Dr. Arkwright among its members. Dr. Bedson has been seconded to work under the committee, and Dr. H. B. Maitland and Mrs. Burberry have been appointed to work with Dr. Bedson. The work is under the general supervision of Dr. Arkwright.

Financial Position of the Institute.—The total expenditure for the year was some £37,500, a decrease of about £6000 on that of last year. Of this sum, over £30,000 was obtained from the sale of sera, vaccines, and stock, and another £3600 from investigation, diagnosis, and analysis fees. The Institute has other sources of revenue in the way of interest and dividends on general investments, and the accounts show a balance of excess of income over expenditure of £11,000.

ROYAL COMMISSION ON NATIONAL HEALTH INSURANCE.—The twenty-seventh meeting of this Commission was held at the Home Office, Whitehall, on May 7th, Lord Lawrence of Kingsgate in the chair. Evidence was continued on behalf of the British Medical Association by Dr. R. A. Bolam, chairman of the Council, Dr. H. B. Brackenbury, chairman of the Representative Body, Dr. H. Guy Dain, chairman of the Insurance Acts Committee, Dr. Alfred Cox, medical secretary, and Mr. N. Bishop Harman, hon. treasurer. The following subjects were dealt with: The procedure for dealing with complaints against doctors, the work of medical institutions under Section 24 (4) of the Act, the need for a unified local health service and the administrative and financial arrangements in connexion therewith, the arrangements for the additional treatment benefits. Dr. Stanley Hodgson, chairman of the Salford Panel Committee, gave evidence on the Manchester and Salford method of payment of doctors on an attendance basis. Dr. J. P. Williams-Freeman, chairman of the Hampshire Panel Committee, gave evidence on the peculiar conditions of rural areas. Thereafter evidence was given on behalf of the Medical Practitioners' Union by Dr. Gordon Ward, Dr. E. A. Gregg, Dr. A. Welply, Mr. Charles Davis, and Mr. S. G. Davis on the various features of medical benefit under the insurance scheme and proposals for extension of that service. Proof copies of the oral evidence and the relative statements submitted at the meeting of April 23rd are now on sale at H.M. Stationery Office (2*s.* 3*d.*).

The Services.

Surg. Vice-Admiral J. Chambers, C.B., C.M.G., Director-General of the Medical Department of the Royal Navy, has been appointed an honorary physician to the King in the place of the late Surg. Vice-Admiral Sir Arthur W. May, K.C.B.

ROYAL NAVAL MEDICAL SERVICE.

Surg.-Comdr. L. Lindop is placed on the Retd. List with the rank of Surg. Capt.

ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Lt. H. Nichol to be Surg. Lt.

ROYAL ARMY MEDICAL CORPS.

Maj. and Bt. Lt.-Col. J. G. Bell to be Lt.-Col., vice Lt.-Col. and Bt. Col. H. Ensor, promoted.

Maj. W. C. Nimmo is placed on the half pay list on account of ill-health.

Capt. L. T. Poole to be Maj.

SUPPLEMENTARY RESERVE OF OFFICERS.

Capt. J. A. Charles, from Reg. Army Res. of Off., R.A.M.C., to be Lt.

TERRITORIAL ARMY.

Surg. Lt. A. C. Ballance (late Royal Navy) to be Capt.

Capt. E. B. Keen to be Maj. (Prov.).

Capt. H. B. Logan resigns his commn. and retains his rank.

TERRITORIAL DECORATION.

The King has conferred the Territorial Decoration upon Col. F. G. Proudfoot; Lt.-Cols. R. M. Vick and Sir Ewen J. Maclean; Majs. R. Coffey, E. J. Boome, D. S. Sutherland, and A. E. Webb-Johnson.

ROYAL AIR FORCE.

Flight Lt. J. K. R. Landells is granted a permanent commission, Flying Officer J. B. Gregor is promoted to the rank of Flight Lt., and Squadron Leader J. H. Wood relinquishes his temporary commission on ceasing to be employed.

INDIAN MEDICAL SERVICE.

Majs. C. E. Palmer, C. H. Reinhold, W. D. Wright, J. F. Boyd, V. N. Whitamore, and W. J. Powell to be Lt.-Cols.

The King has approved the retirement of Majs. C. H. Cross (on account of ill-health) and J. A. Cruickshank.

On return from leave Lt. C. Mullins has been appointed Civil Surgeon, Lushai Hills. Major J. D. Sandes, officiating professor of clinical medicine, Medical College, Calcutta, and second physician to the College Hospitals, has been appointed to act as Principal and Professor of Medicine, Medical College, Calcutta, and First Physician, College Hospitals, vice Lt.-Col. F. A. F. Barnardo, granted leave. The Viceroy has appointed Col. L. F. Smith and Lt.-Col. E. P. Sewell to be Honorary Surgeons on his personal staff, vice Lt.-Col. E. Kyan and Brevet-Col. F. S. Irvine. The following postings of Civil Surgeons in the United Provinces of Agra and Oudh have taken place: Capt. A. Seddon to Saharanpur. Lt.-Col. M. R. C. MacWatters from Shahjahanpur to Meerut; Major R. S. Townsend from Jhansi to Bareilly; Dr. F. W. Holmes from Fatehpur to Gonda; and Dr. H. G. Mathur from Lucknow to Unao. Capt. G. H. Mahony, whose services had been placed temporarily by the Government of India Department of Education, Health, and Lands at the disposal of this Government, has been appointed to be Civil Surgeon and posted to the Amaoti district. The following officers have been granted leave: Lt.-Col. W. D. Richie, civil surgeon, Darrang; Major B. E. M. Newland, civil surgeon, Saharanpur; Lt.-Col. T. Hunter, civil surgeon, Lucknow Lt.-Col. E. C. Hepper, civil surgeon, Bareilly; Major C. H. Reinhold, civil surgeon, Meerut; and Major R. Knowles, professor of protozoology, School of Tropical Medicine and Hygiene, Calcutta. The Chancellor of the Patna University has nominated Lt.-Col. James Masson to be an ordinary fellow of the Senate of the Patna University, vice Col. H. Ainsworth, who has vacated his seat. Lt.-Col. J. D. Graham, Public Health Commissioner, is attending the meeting of the Office International d'Hygiène Publique at Paris as the representative of British India. He will also attend another meeting in London in connexion with matters arising out of the pilgrim traffic with Mecca. The first and principal item of the agenda of the Paris meeting is the project of revising the International Sanitary Convention of Jan. 17th, 1912. Lt.-Col. J. R. J. Tyrell, agency surgeon, acts as Political Agent during the absence on leave of Lt.-Col. G. H. Anderson.

Parliamentary Intelligence.

HOUSE OF LORDS.

WEDNESDAY, MAY 6TH.

The Use of Liquid Milk.

Viscount ASTOR asked whether the Government proposed to take administrative steps to stimulate the dairy industry and increase the use of liquid milk. Milk was the prime food of children, and its consumption in this country was only one-sixth of what it was in Switzerland and one-third of what it was in the United States. They ought to set out to improve the quality of milk in the next ten years. A great deal of the milk sold in London and other large cities had been partially pasteurised; that was a fraud on the public. There was great merit in sufficiently pasteurised milk, but he could see no argument in favour of partially pasteurised milk being sold as raw milk. A new and proper classification of milk was needed. Between 1871 and 1914 the population of this country increased by 60 per cent., but the number of cows only increased by 40 per cent. Between 1914 and 1924 the increase in the number of cows was only 5 per cent., while imports of condensed and dried milks and milk foods increased by 80 per cent.

Lord BLEDISLOE (Parliamentary Secretary, Ministry of Agriculture) said the Government recognised the extreme importance of the problem, but they feared lest in endeavouring to secure pure and disease-free milk for human consumption they might take steps which would tend to dry up the milk-supply altogether, or bring about a milk famine. They deplored the fact that consumption here was less than in other countries, but it was no good passing drastic laws if public opinion was not ripe to endorse them. The sad fact was that neither was the general public alive to the importance of pure milk, nor were farmers sufficiently appreciative of the need to be up to date in their methods compared with other countries to eliminate from their herds unsound cattle and to employ the cleanest possible methods of milk production. A good deal, however, was being done to educate both the public and the farmers.

HOUSE OF COMMONS.

WEDNESDAY, MAY 6TH.

Infection in Public Libraries.

Mr. GROVES asked the Minister of Health whether his attention had been called to the danger of infection to the frequenters of public libraries through the use of books previously handled by persons suffering from infectious ailments, or books having been in homes where infectious ailments had developed; and whether he would consider taking special steps to investigate these possible dangers to public health by calling the attention periodically of local authorities to the need of the utilisation of adequate disinfectants in the public libraries.—Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) replied: The answer to the first part of the question is in the affirmative, but my right hon. friend is advised that medical officers of health are fully alive to whatever danger of infection there may be from this source. Special provisions as to the precautions to be taken to prevent the spread of infection through the use of library books are contained in Section 59 of the Public Health Acts Amendment Act, 1907, and that section may be put in force in any district on the application of the local authority. In the circumstances my right hon. friend does not consider it necessary to undertake any special investigation or to issue any periodical instructions to local authorities on this matter.

Prohibition of Drugs in India.

Mr. CECIL WILSON asked the Under-Secretary of State for India whether his attention had been called to the report of the Bombay excise committee, in which it was recommended that prohibition of drink and drugs should be completed as early as possible; and whether, as the Bombay Government had passed a resolution upon the report to the effect that serious efforts should be made to surmount the financial and administrative difficulties, he could arrange for a copy of the report and of the resolution to be placed in the library.—Earl WINTERTON replied: The attention of my noble friend has been drawn to the report and resolution. The resolution adopts the recommendation of the committee that the Government should declare that the total extinction of the traffic in alcoholic drink and drugs by suitable steps is the goal of their excise policy, and states, in the words quoted by the hon. Member, that a serious effort should be made to surmount the difficulties, both financial and administrative, which stand in the way of the adoption of such a policy. It also outlines the action which the Government propose to take in the immediate future. A copy of the report and resolution will be placed in the Library of the House.

Protection from Anthrax.

Colonel DAY asked the Home Secretary whether he was aware of the fact that, at a recent inquest held in Southwark, it was proved that the death of a docker was found to be due to anthrax, contracted through dust rising from dry hides; were all the statutory precautions being taken at wharves where these hides were handled; and was he prepared to issue an Order for the compulsory sterilisation of all hides, with a view to minimising in every possible way the danger of anthrax infection.—Sir W. JOYNSON-HICKS replied: There have been two recent cases in this area. The statutory precautions applicable are those contained in the Hides and Skins Regulations made under the Factory and Workshops Act, 1901, and the Chief Inspector of Factories informs me that these are in general well observed, and that neither of the cases referred to was due to any breach of the regulations. I regret that it is not practicable to issue an Order as suggested, as there is at present no known effective method of sterilising hides which does not seriously damage them for commercial purposes.

Blind Persons in England and Wales.

Captain FRASER asked the Minister of Health how many blind persons over the age of 16 there were in the United Kingdom; how many of these were in the workhouses; how many lived in institutions and hostels for the blind; and how many in each of the above categories were totally blind or so blind as to be unable to do work for which eyesight was essential, respectively.—Mr. N. CHAMBERLAIN replied: According to the most recent returns, there are in England and Wales 33,564 blind persons over 16 years of age. Of these, it is estimated that approximately 3000 are in workhouses or workhouse infirmaries, 638 blind persons are resident in homes for the blind, and 190 in hostels. No statistics are available for the classification of these blind persons in the manner suggested in the last part of the question.

Mr. ROBERT YOUNG asked the Minister of Health the total number of blind persons in England and Wales respectively; and how many of these men and women were in receipt of an old age pension from 50 years of age and upwards.—Mr. N. CHAMBERLAIN replied: According to the most recent returns there are 36,518 blind persons in England and Wales. On March 31st last 12,024 of those persons between the ages of 50 and 70 were in receipt of the old age pension. Blind persons over 70 receive the old age pension on the ground of age and not of blindness, and no separate figures are available for this group.

THURSDAY, MAY 7TH.

Patients' Strike at Roehampton Hospital.

Colonel DAY asked the Minister of Pensions whether his attention had been drawn to the recent strike of the inmates of the Ministry's institution, Queen Mary's Hospital, Roehampton, arising out of the stoppage of week-end leave; and was he prepared to cause instructions to be given at this and other similar institutions that come under his authority that in future full facilities for week-end leave would be afforded those patients who were deemed medically fit for travelling and who were desirous of visiting their families.—Major TRYON replied: I have inquired into this matter and I find that a number of patients to whom the medical superintendent found himself unable to grant leave deliberately absented themselves without permission. The hon. Member will realise that these men are in hospital solely for the purpose of treatment with the object of improving their condition, and that, in considering any question of leave, regard must be paid to the requirements of the treatment prescribed and to the effective management of the institution. I may point out that the facilities granted are considerably in excess of those allowed by civil hospitals. I see no reason to alter the existing leave regulations which are working satisfactorily at other Ministry hospitals.

Pensioners and Treatment Allowances.

Mr. WINDSOR asked the Minister of Pensions whether, seeing that in the Supplementary Vote for that Ministry provision was made for an additional sum of £920,000 in respect of the payment of treatment allowances in excess of pension, why there was a reduction in the Estimates for the year 1924–25 of £1,140,500 in the provision for treatment and treatment allowances, of which sum practically £500,000 was in respect of allowances in excess of pension; and whether any instructions had been issued to the medical officers of the Ministry that they should as far as possible reduce the number of cases in which allowances should be paid even though the pensioner might be totally disabled, temporarily, as the result of his war disability.—Major TRYON replied: If the hon. Member will refer to the Supplementary Estimate for my department he will see that of the £920,000 mentioned in the first part of the question

only £430,000 was in respect of treatment allowances. The reduction in the estimates for the cost of treatment during the present financial year anticipates a continuance of the decline in our requirements for treatment which has been a normal feature of pensions expenditure for several years past. No change has been made in the conditions of eligibility for treatment allowances and no instructions in the sense suggested by the hon. Member have been issued.

Separate Existence of Pensions Ministry.

Mr. ROBINSON asked the Minister of Pensions whether he had under consideration proposals to transfer the Ministry of Pensions to the Ministry of Health and for the termination of the Ministry of Pensions as a separate department in 1927.—Major TRYON replied: No, Sir; the Government have no such proposals under consideration.

Bursitis as an Industrial Disease.

Mr. TINKER asked the Home Secretary what decision he had arrived at in regard to the inclusion of bursitis in the schedule of industrial diseases for miners' beat-knee.—Sir W. JOYNSON-HICKS replied: No decision has yet been arrived at. As the hon. Member is perhaps aware, a committee of the Medical Research Council has submitted a report on miners' beat-knee, beat-hand, and beat-elbow, and the question—which is a very technical one—whether any alterations in the present descriptions of these injuries are necessary is being carefully considered in the light of that report. The information in regard to the case which the hon. Member brought to my notice will also be taken into account.

Edinburgh Production of Morphia, Heroin, and Codeine.

Lieut.-Commander KENWORTHY asked the Home Secretary how much, respectively, of morphia, heroin, and codeine was made by the two factories in Edinburgh in the year 1924; how much of each of these drugs was exported by British firms; where they were sent; and how were they despatched, whether shipped or sent by parcel post.—Sir W. JOYNSON-HICKS replied: The statistics for 1924 are not yet completed, but I can give provisional figures. The two manufacturing firms made 99,400 oz. of morphine, 16,700 oz. of heroin, and 153,300 oz. of codeine. 88,870 oz. of morphine were exported, but this figure includes the morphine contained in preparations made direct from raw opium. 10,704 oz. of heroin were exported. Statistics of the exports of codeine are not available. The destinations of the exports were approximately as follows: Europe received 60,000 oz. of morphine and 7600 oz. of heroin; Asia 12,500 oz. of morphine and 600 oz. of heroin; Africa 1400 oz. of morphine and 140 oz. of heroin; North and South America 9000 oz. of morphine and 700 oz. of heroin; Australasia 5700 oz. of morphine and 1600 oz. of heroin. The statistics do not distinguish between consignments sent by parcel post and others.

Labour Representation on Asylums Board.

Mr. SCURR asked the Minister of Health whether, when he was appointing persons to serve on the Metropolitan Asylums Board, he would consider nominations made by the London Labour Party and the London Trades Council.—Mr. N. CHAMBERLAIN replied: Yes, Sir.

Nursing Council Rules.

Major BARNETT asked the Minister of Health whether the General Nursing Council for England and Wales had yet submitted for his approval rules providing adequately for the direct representation of registered nurses on the Council, and the prescribed scheme of training required by the Nurses Registration Act, 1919; and, if not, whether he would consider the desirability of appointing a select committee to deal with these matters.—Mr. N. CHAMBERLAIN replied: The General Nursing Council have submitted a revised scheme for the election of nurse members and rules governing the training of candidates for admission to the register. In accordance with the promise given by my predecessor I am prepared to recommend the appointment of a select committee to examine the election scheme and to report upon the desirability of making the adoption of the Council's syllabus of training compulsory.

The Blind Persons Act.

Mr. ROBERT YOUNG asked the Minister of Health whether all local authorities concerned were giving effect to the provisions of the Blind Persons Act, 1920; and whether he could give the number of blind persons who were unemployed and employed, respectively, and the number of those who were under training and of those who were trained but unemployed.—Mr. N. CHAMBERLAIN replied: The answer to the first part of the question is in the affirmative. As regards the second part, the latest figures at present available relate to the year 1923. Of the blind population over school age, 20,759 were then returned as unemployable, 8235 as employed, 1246 as under training, and 880 as trained but unemployed.

Surgical Operations on Young Children.

Colonel DAY asked the Minister of Health whether, seeing that Westminster Hospital had provided facilities enabling mothers to be accommodated in the hospital to nurse back to health their babies who had undergone serious surgical operations, and that many similar operations were performed in different parts of the country at institutions governed by the local boards of guardians, he was prepared to recommend to local unions the advisability of making provision for such cases, in order that every endeavour should be made to save the lives of such babies.—Mr. N. CHAMBERLAIN replied: I am not aware of the nature of the arrangements to which the hon. Member refers, but I am making inquiries in the matter and will communicate with him further.

Pollution of Underground Water.

Lieut.-Colonel FREMANTLE asked the Minister of Health whether, when, and in what form, it was proposed to introduce legislation for safeguarding supplies and preventing pollution of underground water, as proposed in the report of the Advisory Committee on Water, recently issued by the Ministry of Health; and what steps would meanwhile be taken to consult the interests affected.—Mr. N. CHAMBERLAIN replied: I anticipate that the views of the interests affected by the report will be forthcoming at an early date as the result of the publication of the report. Before considering legislation I must, of course, consider those views, and I may add that there are some other matters relating to water-supplies on which legislation may be required and which the Advisory Committee is now proceeding to consider.

Trevethin Committee and Venereal Disease.

Mr. PETO asked the Minister of Health whether the report of the committee presided over by Lord Trevethin was accepted in principle by the Ministry of Health; and whether it was proposed to take any action to carry out the recommendations of the committee.—Mr. N. CHAMBERLAIN replied: The principal recommendations in the report of this committee have been accepted by my department, and action is being taken to give effect to them. As regards the recommendation in paragraph 14 of the report, I may say that I am still in correspondence on this matter with the two societies interested in the combating and prevention of venereal disease.

Health Insurance Surplus.

Mr. BENNETT asked the Minister of Health whether his attention had been called to the fact that the next valuation of the approved societies would show an available surplus for distribution of benefits of between £15,000,000 and £20,000,000; and whether he would consider the existence of such a surplus from the point of view of whether the weekly contributions need be on the present large scale, and from that of the possibilities of pooling health insurance with the other social insurance schemes of the Government respectively.—Mr. N. CHAMBERLAIN replied: I am aware that it has been estimated that the surpluses available for distribution as a result of the second valuation of the approved societies and branches may amount in the aggregate to the figures stated. As regards the second part of the question, the Royal Commission on National Health Insurance have now under review the whole financial structure of the scheme, and I propose to await their findings.

Infantile Mortality in Market Drayton.

Sir CHARLES OMAN asked the Minister of Health whether he had published the report as to high infantile mortality in Market Drayton by the medical woman whom last autumn he sent to inspect and report; whether he was aware that the figures for 1924 showed that the infantile mortality for Market Drayton was far more than twice as high as that for Newport and three times as high as that for Wellington; and, if he had not published it, would he do so at once.—Mr. N. CHAMBERLAIN replied: The answer to the first question is in the negative. The answer to the second is in the affirmative. I understand that the county council are taking steps to carry out the suggestions which I made to them as a result of the report of my medical officer. Accordingly I do not think the third part of the question arises.

Tuberculosis Care Committees' Finances.

Sir JOHN LEIGH asked the Minister of Health whether he was aware that a large balance of unexpended contributions had accumulated in the hands of tuberculosis care committees; what was the total for England and Wales; and how these sums would be utilised.—Mr. N. CHAMBERLAIN replied: The answer to the first part of the question is in the negative. The income of tuberculosis care committees is largely derived from voluntary sources, and I have no control over the funds of these committees. So far as I am aware it is exceptional to find that the income of such committees is in excess of their needs.

Vaccination and Small-pox.

Dr. WATTS asked the Minister of Health if he would furnish figures showing the number of children born, the number vaccinated, the number in respect of whom certificates of conscientious objection had been furnished by the parents during the four years ending Dec. 31st, 1924, and also the number of prosecutions which had been taken in respect of those who had neither been vaccinated or whose parents had not obtained certificates of conscientious objection; and would he take steps to ensure that the Vaccination Acts were properly administered.—Mr. N. CHAMBERLAIN replied: I am not yet able to give the information asked for in the first part of the question for the years 1923 and 1924. For 1921 and 1922 the figures are as follows:—

Year.	No. of births.	No. of children vaccinated.	No. of children in respect of whom certificates of conscientious objection were received.
1921	849,060	324,864	382,157
1922	780,277	314,550	347,511

I have no information as to the number of cases in which proceedings have been taken for the enforcement of the provisions of the Vaccination Acts during the years in question. As regards the last part of the question, the administration of the Vaccination Acts is in the hands of the boards of guardians and their vaccination officers.

Lieut.-Colonel FREMANTLE asked the Minister of Health the number of cases and deaths from small-pox for the first four months of this and the previous three years; the percentage of infant vaccinations to births in the last recorded period and in the previous corresponding periods since 1897; and whether he proposed to rely on present methods of sanitary administration and of vaccination administration to check the further spread of the disease or to promote, and, if so, in what way, a fuller recourse to protection by vaccination.—Mr. N. CHAMBERLAIN replied: The following are the figures asked for in the first part of the question:—

Period.	No. of cases of small-pox.	No. of deaths.
First 4 months of—		
1922	317	1
1923	692	—
1924	1569	3
1925	2214*	3

* Provisional figure.

The latest year for which the percentage of infant vaccination to births can at present be given is 1922. The figures for that and previous years were given in my reply to a question on this subject on April 9th. As regards the last part of the question, I am carefully watching the course of the present outbreak of small-pox, but as at present advised I do not consider it at this time necessary or expedient to modify the existing administrative arrangements for dealing with small-pox.

FRIDAY, MAY 8TH.

Blind Persons Bill.

Mr. R. YOUNG, in moving the second reading of the Blind Persons Bill, said that although there was only a comparatively small number of blind persons in the country they were sufficiently numerous to make it incumbent on the House to take action to place on the community the responsibity of providing sustenance for those who were incapable of looking after themselves, training for those who were capable of being trained, work for those who had been trained, and sustenance for those who by reason of their disability had grown prematurely old. He would not attempt to belittle the work which had been done by voluntary organisations such as St. Dunstan's, but that work demonstrated the clamant need of tackling the problem by municipal and national organisation and assistance. The Blind Persons Act of 1920 did not go far enough, and the present Bill, which was a non-party measure, provided that any blind person of 16 years of age and upwards unable to obtain employment in any workshop or place provided and maintained by the local authority in whose area he resided should receive 25*s.* per week so long as he was unemployed. County councils and councils of county boroughs would be responsible for providing workshops and institutions for the blind. There were at present 3000 blind persons in the workhouses, and these should be removed as soon as possible.

Captain FRASER, who is himself blind, opposed the measure on the ground that it proposed to municipalise all the enterprises and institutions which cared for the blind. But having regard to the general desire in all parts of the House to do something for the blind he asked the Minister of Health to set up a select committee to examine what had been done under the Blind Persons Act, 1920, and to see whether local authorities had done their best or not for blind persons.

Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) said that the Government shared in the general desire to do everything possible to make the lot of blind people better and happier, and he agreed that it ought to be regarded as a non-party matter. The cost to the Exchequer under the existing Act was £467,000 a year, and it was estimated that the present Bill if passed would mean additional commitments by the local authorities of £1,400,000 per annum. He understood that no local authorities had been consulted with regard to the Bill. The proposal that blind persons unable to obtain employment should receive 25*s.* a week was condemned by the advisory committee for the Welfare of the Blind on the ground that it would tend to mitigate individual effort on the part of blind persons. He thought good service was being done by the Ministry of Health in dealing with another side of the problem—the diminution of persons born blind, or who became blind up to the age of 5. The Government could not recommend the House to pass the second reading of the Bill.

Mr. RAINE, who had a motion on the paper for the rejection of the Bill, was speaking at 4 o'clock, when under the rules of the House the debate stood adjourned. The measure was accordingly "talked out."

MONDAY, MAY 11TH.

Education of Tuberculous Children.

Mr. GROVES asked the President of the Board of Education if he had any information respecting the number of children throughout the country suffering from tuberculosis for whom no educational provision was being made; and what steps he proposed to take in the matter.—Lord E. PERCY replied: According to the returns of local authorities for the year ended Dec. 31st last there were, in England and Wales, 8834 children suffering from some form of tuberculosis, who were attending no recognised school or institution. Probably some of these children could suitably be sent to open-air schools by local authorities, and I am doing all I can to encourage the development of this type of school; but the majority are not physically fit to receive formal instruction in school, and, therefore, fall outside the scope of my department.

Pensions Scheme and Health Insurance.

Sir WALTER DE FRECE asked the Minister of Health whether, in connexion with the new insurance scheme of the Government, it was proposed to pool, either eventually or immediately, on an actuarial basis, the contributions to the Health Insurance Fund and those for the new widows and old age pensions schemes.—Sir KINGSLEY WOOD (Parliamentary Secretary to the Ministry of Health) replied: No, Sir. The Bill provides that the part of the weekly contribution which is assigned to the scheme of contributory pensions is to be paid into a pensions account which will be kept entirely separate from the funds relating to national health insurance.

TUESDAY, MAY 12TH.

Birth-rate and Infantile Mortality in Large Towns.

Mr. GROVES asked the Minister of Health if he had any information showing that the large industrial towns with the greatest degree of unemployment showed the highest birth-rates, the greatest degree of overcrowding, and the highest mortality among infants; and what steps he proposed to effect alteration.—Sir KINGSLEY WOOD replied: The figures for certain districts with the highest average degree of unemployment for the 12 months ended February last indicate that in the majority of these districts the birth-rate and the infant mortality-rate for the year 1924, and the percentage of population living more than two persons to a room, according to the census returns for 1921, were above the average for England. There is not, however, sufficient correspondence between the figures to warrant any general conclusion. The Government are exploring all possible means of reducing unemployment, overcrowding, and infant mortality.

Deaths from Small-pox and other Diseases.

Colonel DAY asked the Minister of Health how many deaths had been registered during the half-year ending December last from small-pox, measles, pneumonia, scarlet fever, diphtheria, and influenza.—Sir KINGSLEY WOOD replied: For England and Wales the figures asked for are as follows: Small-pox, 3*; measles, 1317; pneumonia, 12,381; scarlet fever, 426; diphtheria, 1205; influenza, 2145.

* In two of these cases small-pox was entered by the medical practitioner as a contributory cause of death.

Medical News.

UNIVERSITY OF OXFORD: *Fellowship in Physiology at New College.*—The College proposes to elect, not later than October next, to a Fellowship in Physiology. The person elected will be required to undertake, as from Michaelmas term next, the teaching of members of the College reading for the Honour School of Physiology and the medical examinations. Details of the appointment and forms of application can be obtained from the Warden. These forms, duly completed, should be returned to the warden not later than June 15th.

UNIVERSITY OF CAMBRIDGE.—An examination for Part II. of the Cambridge Diploma in Psychological Medicine will be held in London on June 10th, 11th, and 12th. Applications should be made at once to the Registrar, Cambridge University.

UNIVERSITY OF LONDON.—At the election of members to the Senate of the University, which took place on Tuesday, May 12th, Dr. Graham Little, M.P., polled 827 votes, against 281 for Mr. T. B. Layton, in the Faculty of Medicine.

LONDON HOSPITAL MEDICAL COLLEGE (UNIVERSITY OF LONDON).—On Tuesday, June 2nd, the distribution of prizes to successful students will be made by Dr. Charles Mayo, of Rochester, Minnesota, U.S.A., in the library of the College at Turner-street, Mile End, E., at 3 P.M. The distribution will be followed by a garden party.

KING'S COLLEGE HOSPITAL, LONDON.—Upon the recommendation of the medical board, the committee of management have created a new post of psycho-therapist on the honorary staff, and Dr. William Brown, Wilde Reader in Mental Philosophy in the University of Oxford, has been appointed to fill the position.

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH, ROYAL COLLEGE OF SURGEONS OF EDINBURGH, AND ROYAL FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.—The following candidates having passed the requisite examinations have been admitted Diplomates in Public Health:—

David G. Anderson, Malcolm J. Bett, Angus H. Campbell, Agnes F. Dickson, William Fraser, Clara F. Gertzen, Jean M. Gilchrist, Mary M. Jack, James C. Lindsay, Peter L. McKinlay, Elizabeth P. Y. Paterson, George H. Percival, William C. Sharp, Annie V. Taylor, John Walker, Elizabeth Wheatley, Alexander B. Williamson, and Anne C. Wilson.

The following candidates passed Part I.: Ruth M. Allinson, Mary V. F. Beattie, Elizabeth S. Cook, Elsie B. Dickinson, Jane T. Gilmour, Hilda R. Hay, Reuben Levinson, William R. Logan, Elizabeth M. Mackay, Richard Norton, Margaret M. Paterson, Joseph Sachs, Donald A. M. Shearer, Malcolm Somerville, Jeanie M. Strathie, and Hector W. Sutherland.

The following candidate passed Part II.: George A. Pollock.

REBUILDING OF MIDDLESEX HOSPITAL.—In an illustrated article dealing with the present state of Middlesex Hospital we referred last week to a meeting of the Court of Governors which it was proposed to hold on May 11th to discuss the whole question of rebuilding. The meeting was held under the presidency of Prince Arthur of Connaught, and the decision of the hospital board was endorsed to rebuild the hospital and launch an immediate appeal for £500,000. It is satisfactory to note that already a preliminary list of donations totalling nearly £40,000 have been subscribed. The sum of £10,000 has been promised from the King Edward Hospital Fund, £10,000 from the trustees of the Ludlow Estate, £5000 from Mr. Vaughan-Morgan, £2500 from Mr. Ernest Debenham, £1000 from Mr. Collins, and a subscription of £2000 from Lord Rothermere and the *Daily Mail*. Messrs. W. and A. Gilbey have also given 1000 guineas. Some £30 had been sent in from former patients in shillings and half-crowns, while the nurses have promised £500. During the rebuilding of the institution the old infirmary buildings in Cleveland-street will be utilised and, given adequate public support, the work of the hospital will be carried on without curtailment. Among those who addressed the meeting were the Duke of Northumberland, Lord Cheylesmore, Lord Bearsted, Sir Arthur Stanley, Mr. T. P. O'Connor, M.P., Mr. Comyns Berkeley, Major Astor, M.P., and Sir John Bland-Sutton, President of the Royal College of Surgeons, who said that though in the new building it might not be possible to incorporate much of the old hospital, it would be possible to incorporate the wonderful spirit of the old founders and emulate the sympathy for the sick and suffering, which was the dominant feature of the men and women whose humanity led them to build the hospital. The President of the appeal committee is Lord Mildmay of Flete.

ABERDEEN UNIVERSITY CLUB, LONDON.—The bi-annual dinner of this club will be held at Gatti's Restaurant, Strand, London, on Thursday, May 21st, at 7.30 P.M., Sir Arthur Greer in the chair. Dr. W. A. Milligan, 11, Upper Brook-street, W. 1, the hon. secretary, will be pleased to hear from either men or women graduates wishing to join the club or attend the dinner.

ROYAL STATISTICAL SOCIETY.—A meeting of this society will be held on May 19th, at 5.15 P.M., in the hall of the Royal Society of Arts, John-street, Adelphi, London, W.C., when Sir Napier Shaw will read a paper on the Week or Month as an Intermediate Time-unit for Statistical Purposes.

LONDON HOSPITAL: NEW CLINICAL THEATRE.—Lord Bearsted recently laid the foundation-stone of a new clinical theatre with which he is presenting the hospital. He is providing £10,000, and whatever is left of that sum after the building is paid for is to be used in endowing a lectureship in connexion with it.

A CHURCH FOR THE DEAF AND DUMB.—St. Saviour's Church and Institute for the Deaf and Dumb in Oxford-street, London, has had to be pulled down owing to the expansion of the shopping area. Its place has been taken by a new church and institute at Acton, which was last week opened by Princess Mary.

LONDON JEWISH HOSPITAL.—Mr. Bernhard Baron has given £10,000 for the completion of the front block of this hospital on the understanding that the balance of the £25,000 required will be raised. Lord Rothschild, the President, announces that the work will therefore proceed immediately.

ROYAL MICROSCOPICAL SOCIETY.—A meeting of this Society will be held in the lecture hall, 20, Hanover-square, London, W., on Wednesday, May 20th. At 8 P.M. the following papers will be read and discussed: Prof. Robert Chambers (Cornell University Medical College): The Technique of Micro-dissection and Injection of Cells. Mr. F. I. G. Rawlins: A Note on the Use of the Neon Lamp in Microscopy (with demonstration by Mr. J. E. Barnard, F.R.S.). Dr. R. J. Ludford, Ph.D. (Institute of Anatomy, University College): The Cytology of Cancer.

ROYAL EAST SUSSEX HOSPITAL.—Although the income exceeded the expenditure by £2199 at this Hastings institution, it was explained at the eighty-fifth annual meeting, held on May 7th, that this was due to the wonderful and generous response from the public—something like £7000 being raised by way of extraordinary support—and not, as was hoped, an increase in the number of annual subscribers. Special appeals could not continually be made; annual subscribers were the backbone of the financial support of every hospital. The year's work of the institution showed an increase in all departments.

AMERICAN HOSPITAL COSTS.—The sixtieth annual report of the Boston City Hospital shows that the daily cost of each in-patient is 13*s.* 4*d.*; at the convalescent home it is about 10*s.* 6*d.* Out-patients cost 2*s.* per visit. The gynæcological and obstetrical work is increasing with such rapidity that it is difficult to cope with it—"serious results seem almost certain to occur" unless greater facilities are provided. Most of the great American hospitals are, indeed, faced with similar difficulties in consequence of the growing popularity of antenatal clinics and the resulting increase in the number of maternity patients.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Dr. T. W. Eden will deliver a lecture on the Prevention of Puerperal Sepsis in the West Lecture Hall at 1, Wimpole-street, on Monday, May 18th, at 5.30 P.M. On the same date will begin the two weeks' course arranged for the convenience of general practitioners at the London Temperance Hospital from 4.30 P.M. A special course in Diseases of Infants will be held at the Infants Hospital from May 18th to 30th. A two weeks' afternoon course in Dermatology has been arranged from May 18th to the end of the month by the Hospital for Diseases of the Skin (Blackfriars), affording an opportunity for study in the out-patient department and venereal clinics. A special demonstration of cases will take place on May 19th. During June there will be the following courses: Diseases of the Chest, at the Victoria Park Hospital for Diseases of the Heart and Lungs; Gynæcology, at the Chelsea Hospital for Women; Tropical Medicine, at the London School of Hygiene and Tropical Medicine; Urology, at St. Peter's Hospital; Venereal Diseases, at the London Lock Hospital; and an intensive course in general medicine, surgery, and the specialties at the London Temperance Hospital. Copies of each syllabus may be obtained on application to the Secretary to the Fellowship, 1, Wimpole-street, London, W. 1, from whom also a copy of the programme of work may be had.

Medical Diary.

Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.

SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Tuesday, May 19th.

GENERAL MEETING OF FELLOWS: at 5.30 P.M.
Ballot for election to the Fellowship.

Wednesday, May 20th.

HISTORY OF MEDICINE: at 5 P.M.
Annual General Meeting:
Election of Officers and Council for 1925–1926.
Paper:
Mr. W. H. S. Jones: The Historical Value of the Hippocratic Collection.
Exhibit:
Mr. C. E. Wallis: Eighteenth Century Apothecaries' Indentures.

Thursday, May 21st.

DERMATOLOGY: at 5 P.M. (Cases at 4 P.M.)
Annual General Meeting:
Election of Officers and Council for 1925–1926.
Nomination of Corresponding Members.
Cases:
The following will be shown by:—
Dr. H. W. Barber: (Private case) Lichen Nitidus with Lesions on Hard Palate.
Dr. H. MacCormac: (Private case) Leprosy.
Dr. H. C. Semon: Acne Varioliformis.
Dr. J. M. H. MacLeod: Sarcoid.
Dr. G. B. Dowling: Sections of Urticaria Pigmentosa.
Paper:
Prof. Bosellini (Bologna).
The Annual Dinner, at which Prof. Bosellini will be the guest of the Section, will take place at Oddenino's Restaurant, Regent-street, W., on the same evening, at 7.15 for 7.30 P.M. Price 12*s.* 6*d.*, exclusive of wine, payable at the table.

Friday, May 22nd.

STUDY OF DISEASE IN CHILDREN: at 5 P.M. (Cases at 4.30 P.M.)
Annual General Meeting:
Election of Officers and Council for 1925–1926.
Cases will be shown.

Saturday, May 23rd.

BALNEOLOGY AND CLIMATOLOGY:
Annual Provincial Meeting in Brighton:
The Annual General Meeting will be held, by kind permission of the Mayor and Corporation, in the Pavilion, at 3.30 in the afternoon, for the election of Officers and Council.
Dr. Duncan Forbes, M.O.H. Brighton, will read a paper on the Climate of Brighton.
Fellows, Members, and their wives will be received at 4.30 P.M. at the Pavilion by His Worship the Mayor of Brighton, who will kindly provide tea.
The Director of the Pavilion, Mr. Henry D. Roberts, will give a short address on its history, and conduct the party over the building.
The Annual Banquet will take place at the Hotel Metropole.

ROYAL INSTITUTION, 21, Albemarle-street, W.
TUESDAY, May 19th.—5.15 P.M., Prof. R. Whiddington: Passage of Electricity Through Vacuum Tubes (I.).
FRIDAY.—9 P.M., Dr. Thorne M. Carpenter: Metabolism of Man and Animals.

MEDICO-LEGAL SOCIETY, 11, Chandos-street, Cavendish-square, W.
TUESDAY, May 19th.—8.30 P.M., Dr. L. A. Weatherly: Medical Aspects of Some Murder Cases in which Insanity was the Defence. To be followed by a Discussion.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, 11, Chandos-street, Cavendish-square, W.
THURSDAY, May 21st.—7.45 P.M., Demonstration by Lieut.-Colonel J. Cunningham, I.M.S. 8.15 P.M., Paper on Serological Observations on Relapsing Fever in Madras.

TUBERCULOSIS SOCIETY.
FRIDAY, May 22nd.—8 P.M. (at the House of the Society of Medical Officers of Health, Upper Montague-street, Russell-square), Dr. R. Gloyne: Pulmonary Conditions Simulating Tuberculosis.

LONDON DERMATOLOGICAL SOCIETY, St. John's Hospital, 49, Leicester-square, W.C.
WEDNESDAY, May 20th.—4.30 P.M., Clinical Cases and Specimens. 5.15 P.M., Dr. Prosser White: Cutaneous Sensitisation in Industrial Dermatoses.
The monthly dinner will be held at the Cavour Restaurant, Leicester-square, in a private room at 6.30 P.M. Will Fellows intending to be present kindly inform the Hon. Secretary before the meeting?

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, May 18th, to SATURDAY, May 23rd.—WEST LECTURE HALL, Royal Society of Medicine. Lecture arranged by the Fellowship of Medicine and open to all members of the medical profession. At 5.30 P.M., Dr. T. W. Eden: The Prevention of Puerperal Sepsis.—LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W. Special Post-Graduate Course for Practitioners. Daily at 4.30 P.M. Clinical demonstration for one hour, followed by a lecture for half an hour. General medicine, surgery, and special departments.—INFANTS HOSPITAL, Vincent-square, S.W. Special Course in Diseases of Infants. Lectures and demonstrations every afternoon. "Round-table" Conference on Friday, and special visits on Saturday afternoon and Sunday morning.—HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars, S.E. Post-graduate Course in Dermatology, consisting of instruction in the out-patient department every afternoon, and a Venereal Clinic on Tuesday and Friday. Special demonstration of interesting cases on Tuesday, May 19th.—CENTRAL LONDON THROAT, NOSE, AND EAR HOSPITAL, Gray's Inn-road, W.C. Special Course in Laryngology, Rhinology, and Otology. Daily operations, lectures, and clinics. Morning and afternoon sessions. Operative surgery class every morning. Clinical and Operative courses may be taken separately, or combined.—MAUDSLEY HOSPITAL, Denmark-hill, S.E. Course in Psychological Medicine. Lectures on the Psychoneuroses, the Practical Aspect of Mental Deficiency, the Pathology of Mental Diseases; and Demonstrations in Clinical Psychiatry and Clinical Neurology.

NATIONAL HOSPITAL FOR THE PARALYSED AND EPILEPTIC, Queen-square, Bloomsbury, W.C. 1.
POST-GRADUATE COURSE: MAY–JUNE, 1925.
CLINICAL LECTURES AND DEMONSTRATIONS.
MONDAY, May 18th.—2 P.M., Out-patient Clinic: Dr. Hinds Howell. 3.30 P.M., Syphilis of Nervous System: Dr. Adie.
TUESDAY, May 19th.—2 P.M., Out-patient Clinic: Dr. Walshe. 3.30 P.M., Peripheral Neuritis: Dr. Birley.
THURSDAY, May 21st.—2 P.M., Out-patient Clinic: Dr. Kinnier Wilson. 3.30 P.M., Encephalitis Lethargica and its Sequelæ: Dr. Hinds Howell.
FRIDAY, May 22nd.—2 P.M., Out-patient Clinic: Dr. Gordon Holmes. 3.30 P.M., Auditory Nerve Tumours: Mr. Sydney Scott.
COURSE OF LECTURES AND DEMONSTRATIONS ON THE PATHOLOGY OF THE NERVOUS SYSTEM.
MONDAY, May 18th.—12 noon, The Cerebro-Spinal Fluid. Physiology and Pathology: Dr. J. G. Greenfield.
COURSE OF LECTURES AND DEMONSTRATIONS ON THE ANATOMY AND PHYSIOLOGY OF THE NERVOUS SYSTEM.
TUESDAY, May 19th.—12 noon, Structure of Spinal Cord, Brain-stem, and Cerebellum.
THURSDAY, May 21st.—12 noon, The Physiology of the Motor System: Dr. Walshe.
Dr. H. J. Macbride will give a COURSE OF EIGHT CLINICAL DEMONSTRATIONS, chiefly on METHODS OF EXAMINATION OF THE NERVOUS SYSTEM, in the Wards at 10 A.M. on Tuesdays and Fridays, if sufficient entries are received. The fee for this Course will be £2 2*s.* (commencing Tuesday, May 19th).
Mr. Armour and Mr. Sargent operate at the Hospital on Tuesday and Friday mornings at 9 A.M., or at such other times as may be announced.
Any part of the Course may be taken separately. Special arrangements will be made for those unable to take the whole Course.
Fees should be paid to the Secretary of the Hospital at the Office on entering for the Course.
J. G. GREENFIELD, Dean of Medical School.

WEST LONDON POST-GRADUATE COLLEGE, West London Hospital, Hammersmith, W.
MONDAY, May 18th.—12 noon, Mr. Simmonds: Applied Anatomy. 2 P.M., Dr. Scott Pinchin: Medical Out-patients. 2 P.M., Mr. Bishop Harman: Eye Dept.
TUESDAY.—10 A.M., Medical Registrar: Clinical Methods. 12 noon, Dr. Burrell: Chest Cases. 2.30 P.M., Mr. Tyrrell Gray: Surgical Wards.
WEDNESDAY.—2 P.M., Dr. Burnford: Medical Wards. 2 P.M., Dr. Owen: Medical Out-patients. 2.30 P.M., Mr. Donald Armour: Surgical Wards.
THURSDAY.—10 A.M., Dr. Grainger Stewart: Neurological Dept. 11 A.M., Sir Henry Simson: Gynæcological Wards. 2 P.M., Mr. MacDonald: Genito-Urinary Dept.
FRIDAY.—12 noon, Surgical Registrar: Surgical Pathology. 2 P.M., Mr. Sinclair: Surgical Out-patients. 3 P.M., Dr. Pritchard: Medical Wards.
SATURDAY.—10 A.M., Dr. Saunders: Medical Diseases of Children. 10 A.M., Mr. Banks-Davis: Operations on Throat, Nose, and Ear.
Daily, 10 A.M. to 6 P.M., Saturdays, 10 A.M. to 1 P.M., In-patients, Out-patients, Operations, Special Departments.

UNIVERSITY COLLEGE, Gower-street, W.C.
FRIDAY, May 22nd.—5.30 P.M., Prof. G. Elliot Smith, F.R.S.: The Taungs Skull—Missing Links.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

TUESDAY, May 19th.—4.30 P.M., Opening Lectures of Summer Session, Mr. H. W. Carson: The Diagnosis and Prognosis of Cancer of the Rectum.
FRIDAY.—4.30 P.M., Mr. J. Howell Evans: Hydrocele, Hæmatocele, and Pyocele.
Daily.—Clinics in General and Special Departments, Demonstrations, Operations, &c.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, Leicester-square, W.

TUESDAY, May 19th.—5 P.M., Dr. MacCormac: Acne Vulgaris.
THURSDAY.—5 P.M., Dr. Griffith: Skin Eruptions of Syphilis.

HOSPITAL FOR SICK CHILDREN, Great Ormond-street, W.C.

THURSDAY, May 21st.—4 P.M., Dr. T. Thompson: Mental Deficiency in Children.

ST. MARY'S HOSPITAL INSTITUTE OF PATHOLOGY.

THURSDAY, May 21st.—5 P.M., Prof. E. W. Macbride: The Inheritance of Acquired Qualities.

UNIVERSITY OF LIVERPOOL POST-GRADUATE LECTURES. (At 3.30 P.M.)

MONDAY, May 18th.—(At the Shaw-street Hospital.) Mr. Leyland Robinson: Treatment of Fibroids.
TUESDAY.—(At the Maternity Hospital.) Dr. J. W. Burns: Placenta Prævia and Accidental Hæmorrhage.
WEDNESDAY.—(At the St. Paul's Eye Hospital.) Mr. Haward Bywater: Clinical Cases.
THURSDAY.—(At the St. George's Skin Hospital.) Dr. F. H. Barendt: Skin Cases.

MANCHESTER ROYAL INFIRMARY.

TUESDAY, May 19th.—4.15 P.M., Mr. J. P. Buckley: Practical Points in Relation to Hernia.
FRIDAY.—4.15 P.M., Miss Pelle: Massage Demonstration. Mr. J. P. Buckley: Surgical Demonstration.

UNIVERSITY OF SHEFFIELD FACULTY OF MEDICINF.

TUESDAY, May 19th.—8.45 P.M. (in the Medical Library), Prof. Dr. B. Brouwer (University of Amsterdam): The Projection of the Retina in the Brain (in English).

Appointments.

JACOB, F. H., M.D. Lond., has been appointed one of the Medical Referees under the Workmen's Compensation Act for the Districts of the Newark and Nottingham County Courts.

PHILLIPS, P., M.B., Ch.B. Bristol, Medical Superintendent of the Southmead Hospital.

RAINES, R., M.R.C.S., L.R.C.P. Lond., D.P.H., Deputy Assistant Medical Officer of Health, Hull and Goole Port Sanitary Authority.

Cardiff Health and Education Authority: BETENSON, W. F. W., M.B., Ch.B. Aberd., D.P.H., and ROBERTS, T. E., M.B., B.S. Lond., D.P.H. Camb., School Medical Officers.

King's College Hospital: PLAYFAIR, H. J. M., M.D. Lond., F.R.C.P. Lond., Consulting Obstetric and Gynæcological Surgeon and Emeritus Lecturer on Obstetric and Gynæcological Surgery; GILLIATT, W., M.D., M.S. Lond., F.R.C.S. Eng., Obstetric and Gynæcological Surgeon; PALMER, A. C., M.B., B.S. Lond., F.R.C.S. Eng., Junior Obstetric and Gynæcological Surgeon; and WILTSHIRE, H. W., M.D. Camb., F.R.C.P. Lond., Consulting Physician.

New Sussex Hospital for Women and Children, Brighton: WAUCHOPE, G. M., M.B., B.S. Lond., Honorary Assistant Physician; RICKARDS, E., M.B., M.S. Lond., F.R.C.S. Eng., Temporary Assistant Surgeon; LOGAN, B. M., M.B., Ch.B. Aberd., Assistant Anæsthetist.

Vacancies.

For further information refer to the advertisement columns.

Brighton, Hove Hospital.—R.M.O. £175.
Brighton, Royal Sussex County Hospital.—H.P. £150.
Cambridge, Papworth Hall.—Asst. M.O. £300.
Cancer Hospital, Fulham-road, S.W.—H.S. at rate of £100.
Carshalton, Surrey, Queen Mary's Hospital for Children.—Jun. Asst. M.O. £500.
Cassel Hospital for Functional Nervous Disorders, Swaylands, Penshurst, Kent.—R.M.O. £400.
Central London Ophthalmic Hospital, Judd-street, W.C.—Pathologist. £75.
Charing Cross Hospital, W.C.—Res. Anæsthetist at rate of £100.
Chelsea Hospital for Women, Arthur-street, S.W.—Sen. and Jun. H.S.'s at rate of £120 and £100 per annum respectively.
Chester Royal Infirmary.—Hon. Surg.
Doncaster Royal Infirmary.—Asst. H.S. £150.
Dreadnought Hospital, Greenwich.—Anæsthetist. 50 guineas.
East Lancashire Tuberculosis Colony and Sanatorium, Barrowmore Hall, Great Barrow, near Chester.—Asst. M.O. £250.
East London Hospital for Children, &c.—Morning Cas. O. at rate of £120. Also Anæsthetist. £50.
Essex, Administrative County of.—Asst. Tuberculosis O. £600.
Elizabeth Garrett Anderson Hospital, Euston-road, N.W.—H.P., Obstet. Asst., and two H.S.'s. Each at rate of £50.
Evelina Hospital for Children, Southwark, S.E.—H.P. £120. Also Hon. H.P. to Out-patients.
Gloucestershire Royal Infirmary and Eye Institution.—Asst. S.
Huddersfield Royal Infirmary.—Jun. H.S. £150.
Lanark County.—Bacteriologist and Pathologist. £750.
London Temperance Hospital, Hampstead-road, N.W.—Res. M.O. at rate of £175.
Maidstone, Kent County Ophthalmic Hospital.—H.S. £300.
Manchester City.—Female M.O. £632 7s. 8d.
Manchester, East Lancashire Homes for Disabled Sailors and Soldiers, Broughton House, Park-lane, Kersal.—Res. Med. Supt. £400.
Metropolitan Hospital, Kingsland-road, E.—Asst. P.
Middlesex County Council.—Deputy County M.O.H. at rate of £900.
Mildmay Mission Hospital, Austin-street, Bethnal Green, E.—Sen. Res. M.O. £140. Also Jun. Res. M.O. £100.
Miller General Hospital for South-East London, Greenwich-road, S.E.—Res. Cas. O. £150.
Monmouthshire County Council.—Asst. M.O. £500.
Newcastle-upon-Tyne, Royal Victoria Infirmary.—Hon. S.
Nuneaton, Caldecote Hall, Home for Male Inebriates.—Res. Med. Supt. £400.
Oxford, Radcliffe Infirmary and County Hospital.—H.S. and Cas. H.S. Each at rate of £120.
Paddington Metropolitan Borough.—M.O.H. £1000.
Patna, India, Medical College.—Prof. of Pharmacology, Prof. of Anatomy, and Prof. of Physiology. Each Rs.1200 per mensem.
Portsmouth, Royal Portsmouth Hospital.—Cas. O. at rate of £100.
Radcliffe-on-Trent, Notts County Mental Hospital.—Jun. Asst. M.O. £300.
Royal College of Surgeons of England.—Election to Court of Examiners. Also Professors and Lecturers.
Royal Dental Hospital of London, Leicester-square, W.C.—Two Hon. Asst. Dent. S.'s.
Royal Northern Hospital, Holloway, N.—Obstet. S.
Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.—Cas. O. £150. H.S. and H.P. Each at rate of £100. Also Hon. P. and Asst. in X Ray Dept.
St. Bartholomew's Hospital, Special Treatment Centre, Golden-lane.—Clin. Asstships.
St. Mary Abbots Hospital, Marloes-road, Kensington.—Fourth Asst. M.O. £335 6s.
Salford Union Infirmary, Hope, Pendleton, near Manchester.—Asst. Res. M.O. at rate of £275.
Shrewsbury Borough.—M.O.H., &c. £800.
Stoke-on-Trent, Bucknall Infectious Diseases Hospital.—Asst. M.O. £200.
Truro, Royal Cornwall Infirmary.—H.S. £170.
Victoria Hospital for Children, Tite-street, Chelsea, S.W.—Hon. P. to Out-patients.
Wigan Infirmary.—Third H.S. at rate of £150.
Wolverhampton and Staffordshire Hospital.—R.M.O. at rate of £150.

The Chief Inspector of Factories, Home Office, London, S.W., announces vacant appointments at Borrowash, Derby; and Yaxley, Hunts.

Births, Marriages, and Deaths.

BIRTHS.

HORGAN.—On May 4th, at Rua do Sacramento á Lapa 25, Lisbon, the wife of Dr. D. St. Helier Horgan, of a son.
MILLS.—On May 2nd, at Lancaster House, Southwold, Suffolk, the wife of Major P. S. Mills, I.M.S., of a daughter (Anne).

MARRIAGES.

CROOKSHANK—BONHOURE.—On May 9th, in London, F. G. Crookshank, M.D., F.R.C.P., to Hélène, second daughter of the late Prof. Gustave Bonhoure, of Vendôme.
HUTTON—LINTOTT.—On April 30th, at Godalming, Samuel King Hutton, M.B., F.R.G.S., of "Kivalek," Parkstone-road, Poole, to Mary, daughter of Henry Lintott, Esq., of Chiddingfold, Surrey.
SHEPHERD—WISEMAN.—On May 7th, at Aurdal, Norway, Charles Woolley Shepperd, M.B., B.S., of St. Andrew's-crescent, Cardiff, to Aagot "Mosse," youngest daughter of Dr. and Mrs. Wiseman, of Tonsaasen, Norway.

DEATHS.

DUGUID.—On May 5th, in a nursing home at Aberdeen, William Robert Duguid, M.B., C.M., aged 56 years.
HUME.—On May 6th, at Fircroft, St. Mary Church, Torquay, Walter Augustus Hume, M.R.C.S., L.S.A., in his 69th year.
TRAVIS.—On May 4th, at the residence of Mr. John Hughes, The Manor House, Hampton, Middlesex, William Owen Travis, M.D., aged 68 years.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Comments, and Abstracts.

TUBERCULOSIS WORK IN CANADA.

IN an address which he gave recently to the Society of Superintendents of Tuberculosis Institutions, Dr. R. E. Wodehouse, Secretary of the Canadian Tuberculosis Association, showed by statistics the remarkable fall in the death-rate from tuberculosis in Canada since 1901, with more detailed figures showing the same fall in the industrial city of Hamilton, Ontario. In 1901 the death-rate from all forms of tuberculosis in Canada was 180; in 1924 it was 84·7 per 100,000 of the population. Hamilton showed a fall from 121 per 100,000 in 1905 to 43·4 in 1924. In this city the deaths from non-pulmonary tuberculosis averaged 15 per cent. of the total deaths from tuberculosis, and showed practically the same fall in the death-rate as in the case of pulmonary tuberculosis. The death-rate from tuberculosis was falling faster than the death-rate from all causes, the former being approximately 8 per cent. of the latter in 1905 and 5 per cent. in 1924. In Hamilton in 1913 and 1914 there was a backward wave in the tuberculosis death-rate which could not have been a war effect. In the different provinces in Canada the tuberculosis death-rate per 100,000 in 1922 was 132 in Nova Scotia and 121 in Quebec, while only 66 in Ontario, 74 in British Columbia, 60 in Manitoba, 51 in Alberta, and 44 in Saskatchewan. The number of sanatorium beds provided per 100,000 of population was low in Quebec (21), high in Nova Scotia (62), Manitoba (61), and Ontario (68), and intermediate in the other provinces named. This represented on the average 635 beds per 1000 deaths. The chief feature of these statistics was the backwardness of the province of Quebec, with mainly a French population. A large provision of new beds was, however, being made in Quebec. The general hospitals aided by government grants in Alberta, British Columbia, Manitoba, Ontario, and Saskatchewan kept 10 per cent. of their beds for tuberculous patients.

In Canada there were, Dr. Wodehouse said, no tuberculosis officers. The work was done by travelling diagnosticians and by the staffs of sanatoriums to whom the general practitioners sent cases for examination. Children with defective teeth had a 12 per cent. higher incidence of tuberculosis. He outlined the scheme for dealing with tuberculosis in Quebec, which was similar to the Framingham experiment. He emphasised the difficulties of the work among the Indians because of their nomadic instincts. Yet with them wonderful results were obtained despite their lack of rest and terrific output of energy, if only the diet were made abundant. In Canadian sanatoriums the tendency was to rest even afebrile patients for long periods, and graduated labour was not looked upon with favour. The cases were in a more advanced stage than in English sanatoriums. Sanatorium costs were usually from 10*s.* to 12*s.* per patient per day as compared with an average of 6*s.* in England, the greater cost being due to the generally higher standard of wages.

In regard to vocational training, it was pointed out that few who received such training stuck to it permanently, and it was therefore being abandoned as being neither feasible nor wise. New York had similarly given up factories for tuberculous people and had resorted to placing the tuberculous in ordinary industries. There was no real isolation of cases but a distinct policy of getting cases into sanatoriums for prolonged treatment. Compulsion, though provided by the law, was not enforced. Hitherto all effort in Canada had been concentrated on pulmonary tuberculosis, and surgical tuberculosis had been left to the general and children's hospitals to deal with. Sanatoriums were well heated in winter and were mainly built of wood, a material regarded in Canada as "permanent."

In thanking Dr. Wodehouse for his address, Dr. James Watt, President of the Society, said that the Canadian figures showed health activities to be responsible for a falling tuberculosis death-rate. In this country too much stress, he suggested, had been laid on improvement in economic conditions.

RE-EDUCATION IN ALEXIA.

To the Editor of THE LANCET.

SIR,—In the treatment of disorders of speech it is not uncommon to meet with cases of aphasia in which a defect of speech may be found in conjunction with another allied defect. The following case may prove of interest.

A boy, aged 11, a patient at the West London Hospital, was sent to me for treatment. He had had meningitis two years previously, and since then had entirely lost the power to read—a type of aphasia classed as alexia. Before the onset of the illness he had done well at school, and passed the usual standards. At five years old he had been a good reader for his age. At the time that he came to me, in addition to the alexic condition, he stammered badly when excited, but all his other faculties were intact, and his intelligence appeared perfectly normal. He suffered from night-terrors, and was otherwise of a highly-strung, nervous temperament.

The plan on which I proceeded to deal with the condition of alexia was that of establishing a complete mental cycle. I selected several objects in common use, or commonly seen, the names of which consisted of one syllable (later two), and of two, three, or four letters, such as ink, cap, bag, bat, ball, hat, dog. Pointing to one such object I would get him to name it. When he had said the word I made him repeat it carefully, listening to his own pronunciation, and then analyse the sounds of which it consisted, as in the teaching of phonetics. I then got him to name the letter represented by each sound respectively, in order of occurrence, and having done so, to write it down, until the complete word was written. He then had to pronounce the word again while looking at it, first as written down by himself, and immediately afterwards from a blackboard on which I wrote it. Finally, having thus named the written word, he was asked to point out the object which it represented, thus arriving back at the point from which he had started and so completing the circuit. After a few words had been worked through in this way, the first word would be returned to and read from the blackboard without the preliminary process of object-recognition, thus encouraging the establishment of word-memory images, and the words so read on one day would be repeated on the next, while the longer process of linking up associations was gone through with fresh objects—verbs being represented by the appropriate actions.

The plan was successful. After about three weekly visits (the procedure meanwhile being followed up at home) the patient was reading simple sentences with creditable ease, and once the wheel had, so to speak, been set revolving, the power to recognise other words returned.

I am, Sir, yours faithfully,

(Miss) W. MARSHALL WARD,
Instructor for Speech Defects at the West London and Bethlem Royal Hospitals; Director of the Western Speech Clinic.

May 11th, 1925.

CLEAN MILK IN HOSPITALS.

Dr. Chalmers Watson has been able to obtain simultaneous insertion of his article on Clean Milk in four principal Scottish daily journals. He lays stress on the amazing fact that apparently none of the leading general hospitals or children's hospitals in Scotland have given serious consideration to their milk-supply. This, he thinks, is the more remarkable, inasmuch as two-thirds of disease in children's hospitals arises directly from defective nutrition and very largely from the impurity of the milk-supply. There are, he adds, at the present time, only 12 producers of certified milk in Scotland and 21 producers of Grade A tuberculin tested. Although the number of clean milk producers may be six or seven times as large in England, he has ascertained that practically no hospital, save perhaps local hospitals in the immediate vicinity of a producer's farm, takes certified milk. Several hospitals are making inquiries at the present time as to the use of Grade A tuberculin tested, while St. Bartholomew's Hospital actually uses it. Middlesex Hospital obtains Grade A milk for the maternity and children's ward and for all throat cases, and proposes to extend its use. Certain local authorities also have instructed their milk dealers that, as from July next, their welfare centres must be provided with Grade A T.T. In this connexion the borough of Bermondsey is quoted as taking the lead.

WATER-PIPES AND ELECTRIC CURRENTS.

IN a recent article Dr. J. C. Thresh (THE LANCET, March 28th, p. 676) stated that copper water-pipes should not be used for earthing electric current for fear of setting up electrolytic action, whereby copper would go into solution. A correspondent inquires whether any similar objection applies to attaching the earth-wire of a "wireless" set to a lead pipe or watertank. We are informed that using such pipes for wireless earths cannot possibly affect either the pipes or the water, as any currents that would flow to earth through them besides being infinitesimal in amount are rapidly alternating and so could have no electrolytic action. The situation is entirely different in regard to the earthing of the returning track and conductors of a tramway system where a few hundred ampères of direct current may be flowing about in the earth and be very willing to accept the help of any metallic conductor, such as a pipe, on their way back to the power station. This nuisance has, of course, long ago been dealt with to everyone's satisfaction by the Board of Trade.

MR. GREIFFENHAGEN'S PORTRAIT OF SIR DONALD MACALISTER.

A REFERENCE made last week to the possible destination of Mr. Greiffenhagen's portrait of Sir Donald MacAlister has brought us the information that the picture exhibited at Burlington House is taken from the one presented by Lady MacAlister to the General Medical Council.